The Builder.

VOL. LXXV. No. 2901. SEPTEMBER 10, 1898.

ILLUSTRATIONS.

New Chapel, Giggleswick School.—Mr. T. G. Jackson, R.A., architect ..... *Double-Page Photo-Litho.*
Façade of a Town House.—Mr. M. S. Hack, A.R.I.B.A., architect ..... *Single-Page Ink-Photo.*
Premises, Friar Lane, Leicester.—Mr. M. S. Hack, A.R.I.B.A., architect ..... *Single-Page Ink-Photo.*
Part of House, "Cliff Towers."—Mr. C. Harrison Townsend, F.R.I.B.A., architect ..... *Single-Page Ink-Photo.*
New Altar, St. Mary's, Chaddesden, Derby.—Mr. Henry Rose, architect ..... *Single-Page Ink-Photo.*
New Chancel, &c., St. Bartholomew's Church, Southsea.—Messrs. W. A. Coombs & E. Towry Whyte, architects ..... *Single-Page Ink-Photo.*
"Prix de Rome" Prize Designs, Ecole des Beaux-Arts, Paris:—
First Prize in Architecture: "A Palace for Entertaining the Illustrious Guests of France."—M. Léon Chifflot .....
First Prize in Painting: "The Pool of Bethesda."—M. Gibert ..... *Double-Page Ink-Photo.*
Second Prize in Sculpture: "Cain After the Death of Abel."—M. Boucher .....

Blocks in Text.

"Sultana's House," Fathpur Sikrî: Piers and Brackets carrying Lintels of Verandah Roof.—From "Portfolio of Indian Architectural Drawings" ..... Page 222
Detail of one of the Brackets in "Sultana's House," Fathpur Sikrî.—From "Portfolio of Indian Architectural Drawings" ,, 223
Sketch Elevation of New Theatre, Kiew.—Professor Victor Schroeter, Architect ..... ,, 228
Sketch Plan of New Theatre, Kiew ..... Page 229
Chapel, Giggleswick School. Plan ..... ,, 230
A Town House. Plan ..... ,, 231
St. Mary's, Chaddesden. Plan ..... ,, 231
St. Bartholomew's Church, Southsea. Plan ..... ,, 232
Illustrations to "Students Column" ..... ,, 234

CONTENTS.

The Mogul Architecture of Fathpur Sikrî 221
The Collection and Disposal of Refuse 224
Notes 225
The New Municipal Theatre at Kiew 228
Notes on the Design and Erection of Architectural Ironwork .. 228
Unclaimed Drawings 230
New Chapel, Giggleswick School 230
Facade of a Town House 230
Cliff Towers 230
New Altar, St. Mary's, Chaddesden, Derby 230
St. Bartholomew's Church, Southsea 231
"Prix de Rome" Prize Drawings 231
Magazines and Reviews 231
Competitions 232
Books: J. Robert Robinson's "The Princely Chandos;" Richard Henderson's "The Young Estate Manager's Guide;" "Journal of the Sanitary Institute;" A. W. F. Langham and A. Whillier's "Arnold's Scale Drawing Sheets;" Richard Kerr's "Wireless Telegraphy Popularly Explained;" W. Perren Maycock's "Electric Wiring and Fitting Details Book" 232
Trade Catalogues 233
Thomas Drew, Architect, 1760 (?) 234
James II.'s Statue, Whitehall 234
Appointment of Architect, Salford Workhouse 234
The Students' Column: Sound, Light, and Heat.—XI. 234
Obituary 235
General Building News 235
Sanitary and Engineering News 236
Stained Glass and Decoration 236
Foreign 236
Miscellaneous 237
Capital and Labour 237
Legal 237
Recent Patents 238
Some Recent Sales of Property 239

The Mogul Architecture of Fathpur Sikrî.

EVERY Englishman who feels a patriotic interest in the great deeds of his own countrymen in past days ought to wish to visit India, the conquest and the regeneration and the government of which by the English race is perhaps the chapter in our history, in the modern era, of which we may think with most pride. And if the Englishman happen also to be an English architect he has a double reason for feeling interest in and a desire to visit the country, not so much on account of the architectural remains of the indigenous race—for we consider the various types of Hindu architecture, regarded in a purely artistic light, not by any means worth the enthusiasm which Fergusson felt and expressed for them—as on account of the rare combination of refinement with richness of detail which was realised by the Saracenic mind working on the suggestions of Hindu architecture. That is where the real greatness of the architecture of the Indian peninsula is to be found. The weak point of pure Saracenic architecture, with all its beauty, is its want of monumental solidity of character. The Mahomedan conquerors in India found in the Hindu monuments the element of mass and solidity of appearance and structure, defaced more or less by barbaric detail and disproportion of parts, and characterised by ornament in which a good deal of beauty, derived mainly from floral forms, was intermixed with grotesque figures of human or semi-human character, with hideous idol travesties of human form and monstrous animals. They adopted, in their buildings in the conquered portions of the country, the solid character of the Hindu architecture, but refined its forms and proportions. Their religion fortunately put them out of the reach of the temptation to adopt travesties of human or animal forms as ornament, and they introduced into their buildings a whole system of exquisite ornamental detail based on geometrical forms and on conventional foliage, and combining some of the best qualities of Hindu detail with that which was more essentially Saracenic in character. They thus produced an architecture, or at least a great many works of architecture, in which the greatest richness of detail is combined with the greatest refinement of taste, with a success which is hardly perhaps to be found anywhere else in the world.

Unfortunately comparatively few of those whose professional career does not call them to India have the means and the leisure to make a personal inspection of these beautiful works in a distant part of the Empire. But the Government of India, by means of the work of their Archæological Survey, have done and are still doing a great deal towards providing those at home with adequate illustrations of Indian architecture. It is true that in the productions of the Archæological Survey there is to be felt the want of the truly architectural or artistic mind, and we are inclined to think that the information contained in the literary portion of these official publications must be taken with reserve. But we are indebted to the Survey for a very valuable collection of illustrative drawings. The last addition to these is the portfolio of drawings from the buildings at Fathpur Sîkrî, made under the direction of Mr. Edmund W. Smith, and which are on a larger scale and executed with higher finish than those attached to the ordinary official volumes of the Survey.

The English writing of Indian names has undergone a bewildering variety of changes, and readers may not immediately recognise that Fathpur Sîkrî is the now orthodox and officially recognised spelling of the place we have formerly known as Futtehpore Sikri.* Fathpur Sîkrî, situated a little over twenty miles nearly due west of Agra, has been called a kind of Pompeii of Mogul architecture, but with the fortunate difference that the principal buildings are in much more complete condition, architecturally, than those at Pompeii. A plan of the place is given in Vol. XVIII. of the Archæological Survey, showing an irregular collection of buildings which are all regular and symmetrical in themselves, but disposed at various angles to one another. The whole place owes its origin to Akbar, during the latter half of the sixteenth century. According to the general description given in the preface to the eighteenth volume of the Archæological Survey, the entire city is about seven miles in circumference. "Down the centre of the city, from south-west to north-east, runs a red sandstone ridge, and all the monumental structures with which this Report deals are built upon it. The palaces must have been deserted soon after Akbar's demise, for Finch visited the town in the early part of Jehângir's time" (the son of Akbar) "and 'found it ruinate, lying like a waste district and very dangerous to pass through at night.'" The selection of the site for the town seems to have been made, in all probability, from some motive of religion or superstition connected with it, and the position of the principal group of buildings may have been determined on the practical ground of the existence of the sandstone ridge, which furnished the stone for the buildings, easily carved into all the multiplicity of ornament aimed at, but for the same reason rather liable to the decay which has destroyed or injured some portions of the surface work.

The most remarkable buildings are a great mosque with an immense cloistered courtyard and a magnificent gateway (a later addition) on the southern side, which forms one of the most effective illustrations in Fergusson's book on Indian and Eastern architecture; a palace which may rather be called a collection of small palaces, the three most beautiful of which were erected for three of the wives of Akbar, and the Panch Mahal, a very characteristic erection in a somewhat different style to the most prominent of the other buildings, and somewhat resembling a Buddhist Vihara

* There has been recently, we believe, a serious attempt to settle the spelling of Indian names on a recognised logical and philological principle, and therefore there will perhaps be an end now to the perpetual changes which perplex the readers of books on India.

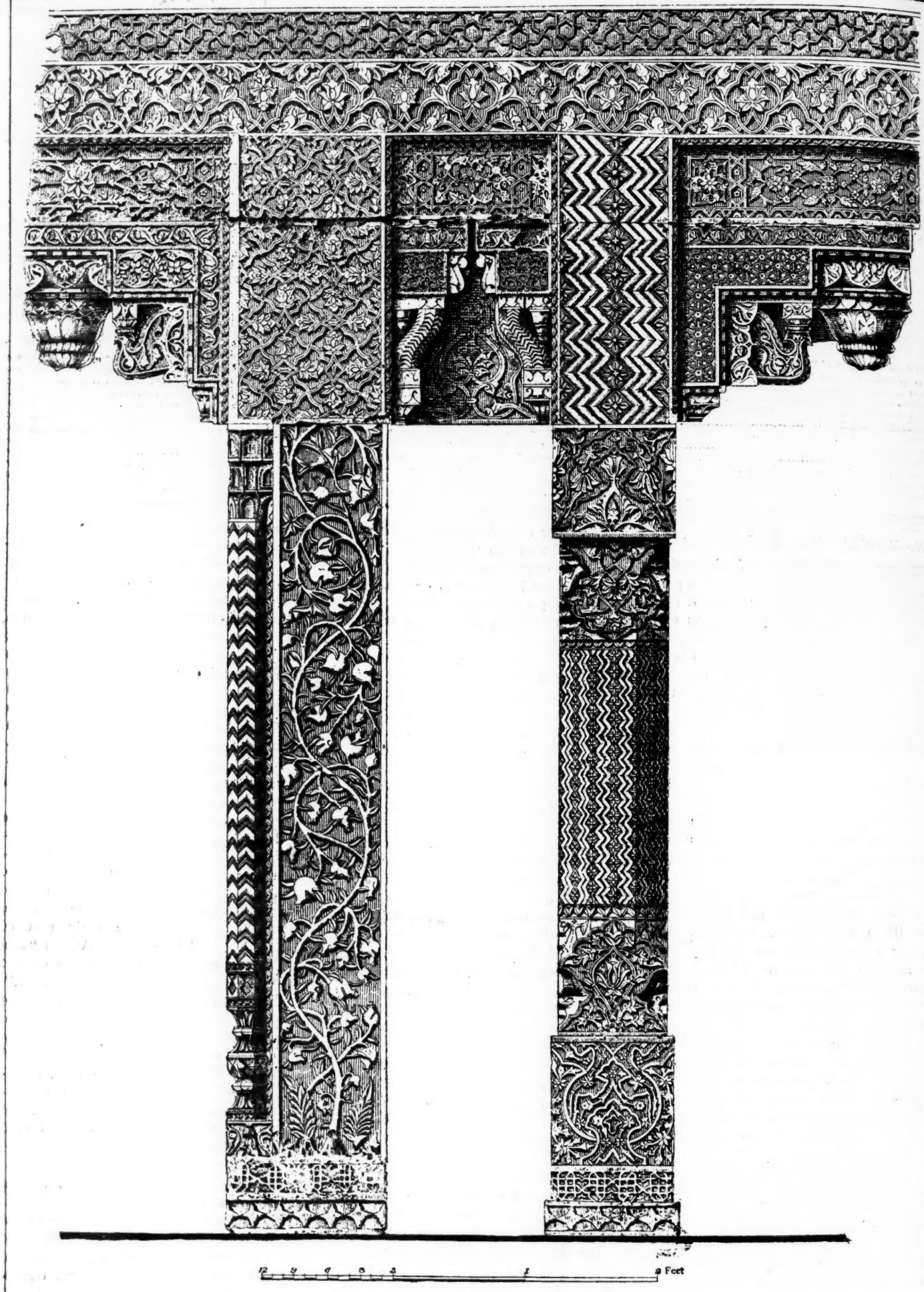


Fig. 1.—"Sultana's House," Fathpur Sikrî: Piers and Brackets carrying Lintels of Verandah Roof.—From "Portfolio of Indian Architectural Drawings."

in general idea, consisting as it does of successive stories each carried by a colonnade, but each smaller in area than the one below it, so that the whole has a pyramidal form, and finishes in a small pavilion with a pillar at each angle. The columns are spaced in squares all over the floors, at a distance averaging about 9 ft. from centre to centre, the columns of each floor over some of those of the floor below; the whole making a series of covered promenades open at the sides. The mosque, which in the Archæological Survey is called "The Great Masjid," is distinguished in the portfolio of drawings as the Jami' Masjid, the same word as "Jumma Musjid," a name which has been more generally connected by architectural readers with the great mosque at Jaunpore

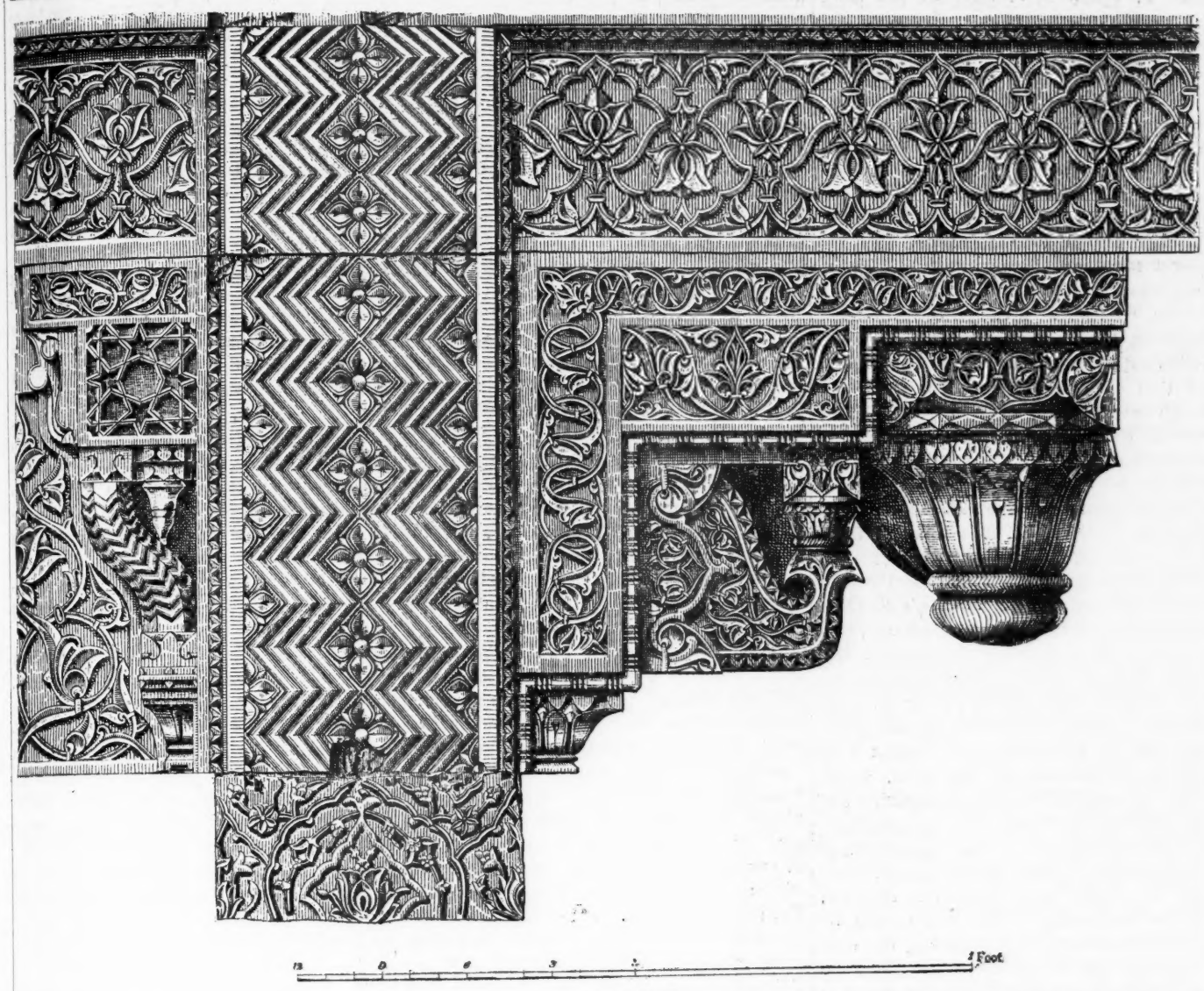


Fig. 2.—Detail of one of the Brackets in "Sultana's House," Fathpur Sîkrî.—From "Portfolio of Indian Architectural Drawings."

but which means merely the "Friday Mosque," and is applied to several buildings of the same class in India.

Judging from the disposition of the buildings, Fergusson was probably right in thinking that the one known as the "Khas-Mahal," partly surrounding a courtyard with a tank in it, was the initial building of the palace, though it was not that on which the greatest elaboration was bestowed. This was reserved, in the palace, for the three houses supposed to have been erected for Akbar's three favourite wives, the most beautiful of which, called the Turkish Sultana's house, is an addition to the north-east angle of the Khas-Mahal. This is a small building, nor does the photograph of it in the Survey, where it appears reflected in the calm water of a tank, seem to justify Fergusson's praise, that "it is impossible to conceive anything so picturesque in outline, or any building carved and ornamented to such an extent, without the smallest approach to being overdone or in bad taste." As a whole it is not very picturesque in outline; and the lean-to roofs, projecting a considerable way beyond the line of the porticoes, have a somewhat clumsy effect, and moreover do not seem architecturally in character with the supports, the design of which, when seen alone, rather suggests that they are things more in keeping with a flat-roofed building; certainly, in the view, they seem overweighted by the overhanging roofs. On the other hand, nothing in its way could be more beautiful than the work on the pillars and brackets, of which we give two illustrations, reduced from the large plates in the Portfolio. The ornament is varied continually; the bracket of which the detail is given in fig. 2, it will be observed, is different in its ornament from that shown in conjunction with the two pillars in fig. 1, though similar in general design. The inner faces of the sloping roofs are very richly treated in carved square panels, and have a rich effect in themselves, as seen in the photograph of the interior in the "Survey;" but here again we feel that the sloping line sits awkwardly on the walls and supports, and the enrichment itself of the ceiling seems more in keeping with a flat ceiling than with a raking one. The brackets, of course, are not very constructional in form; but no more are the pendants of a Tudor vault, if it comes to that. The lean-to roofs, it may be added, are described as cut out of solid blocks of stone; one can understand that the width (about 8 ft.) might be spanned by one length of stone, but one can hardly suppose that the whole portion of the roof shown on Plate V. is in one block of stone, and no jointing lines are indicated. The panels, about 7 in. square, are filled with small and elaborate ornament, mostly delicate geometrical tracery in bars about $\frac{1}{8}$ in. thick. All these details are carefully given to scale.

Among the drawings from the Jami' Masjid the finest is that of the principal Mihrab, with a rich mixture of ornament of Saracenic and Hindu types, the inlaid band of ornament round the inner niche being completely Saracenic in design—it might have come from the Alhambra, while the projecting bud-forms which make a delicate fringe round the inner archivolt of the larger arch are as distinctly Hindu in character. The principal dome of the mosque, it may be remembered, is carried on large corbels, each projecting course of which is defined by a double band of carved ornament, one on the upright face, the other on the *cyma* moulding above—seen in the detail drawing, apart from the main design, this is a rich and striking piece of decorative masonry; but it cannot be denied that it looks rather clumsy and heavy in its place under the dome, and compares very unfavourably with the pendentive form of support.

Inside the quadrangle of the Mosque Salim Chisti's tomb, a square domed erection, is a fine and interesting work, decorated internally with colour; to the illustration of the coloured decorations two fine plates are devoted, but we have no information as to the present state of the coloured work, or how much of these plates is restoration.

The detail of the small entrance in the eastern screen in this tomb is drawn with great care to a pretty large scale on Plate XLIV., and is almost purely Arabic in style. This tomb is dated at 1581; we are not given the authorities for the dates; but, accepting them as correct, the fact of this more decidedly Arabic style in a work later in date than the Mosque and the Sultana's house (which is dated as 1565),

seems to throw some light on the style of the Panch Mahal, which differs materially in style and manner from the buildings the illustrations of which have already been referred to. No drawings of this structure are given in the "Portfolio," but there are two or three photographs of it in the "Survey," and from these it is evident that it is much more Indian in style than some of the other buildings; the design of the columns is rather Hindu than Saracenic, and the general form, as already observed, rather resembles that of a Buddhist Vihara. In the Sultana Palace the details are much more Saracenic, though the form of the brackets retains a distinct impression of Hindu taste, and that of the columns to some extent, though not so much; while in Salim Chisti's tomb we come on work of an almost purely Saracenic character. The conclusion would seem to be that the Saracenic taste and influence became more marked as the buildings went on, the older ones retaining more of the native impress.

The drawings which form the Portfolio were prepared, under the compiler's direction and supervision, by native draughtsmen, who had received preliminary training in the Indian Schools of Art before entering the Archæological Department. They do great credit to the skill and care of the draughtsmen, but of course to some extent they must be restorations of the work, which cannot be supposed to exist in anything like this complete condition. Some photographs of detail, giving the precise impression of the work as it now stands, would have been a useful and desirable addition, and we may suggest that this should be taken in consideration in preparing the next Portfolio of the series, for it is understood that others are to follow if this one seems to meet with success and approval. However, as it is, we are very glad to have it, and may congratulate Mr. Smith and the Archæological Survey on the results of his labours.

THE COLLECTION AND DISPOSAL OF REFUSE.

IN the "good old times," to which the pessimists of to-day are so fond of directing our attention, the disposal of refuse was so vilely done, or, rather, left undone, that plague and pestilence were the common scourges of the "civilised" world. Householders had no concern for the cleanliness of the streets, but threw their garbage out of windows and doors, heedless of stenches and ignorant of the fearful results of such insanitary practices. When Dr. Johnson visited Edinburgh and, one dusky night, "walked arm-in-arm up the High-street" with his devoted friend Boswell, the latter, for all his wishing, "could not prevent his being assailed by the evening effluvia of Edinburgh. . . . As we marched slowly along," says Boswell, "he grumbled in my ear, 'I smell you in the dark!'" On another occasion Johnson referred, in the plainest of plain English, to some of the utensils which were emptied on the heads of benighted pedestrians in the Scottish capital; and Boswell tells of a distinguished baronet who was wont to observe that "walking the streets of Edinburgh at night was pretty perilous and a good deal odoriferous." What the state of affairs was before Boswell wrote decency forbids us to inquire, for the utmost that even he could say in favour of the sanitary condition of the city in his time was that "the peril is much abated by the care which the magistrates have taken to enforce the city laws against throwing foul water from the windows; but, from the structure of the houses in the old town, which consist of many stories, in each of which a different family lives, and there being no covered sewers, the odour still continues."

Edinburgh was no worse than many other towns, although we of to-day can scarcely credit the fact. It is almost impossible to believe that it is little more than a century since Boswell's words were written, and that the practises and methods he describes continued with little change for many years afterwards. Improvement in cleanliness is one of the truest tests of advancing civilisation, and it will be one of the glories of the nineteenth century that it has done so much towards making foul places clean, towards improving the construction and sanitation of dwellings and streets, and towards the quick removal and satisfactory disposal of noxious refuse of all kinds.

Much yet remains to be done before the sanitary ideal is reached; every town has still its slums, and many have unpaved streets reeking with filth, open middens filled with decaying garbage and worse, overflowing privies and cesspools, and defective drainage and sewerage. Many country-places are still the dumping grounds for the foul refuse of towns, and many of our rivers are still the common sewers of the districts through which they flow. Even New York, amid its grandiose avenues, had, up to 1895, streets littered with refuse of all descriptions. When Colonel Waring, in that year, became head of the Street-cleaning Department of the city, he found a chaos of dirt which is almost incredible. East Fourth-street, he wrote at the time, "has the appearance of being the dumping-ground of the whole ward"; Pitt-street was covered with "mud, ashes, filth, and garbage. . . . to the depth of about 8 in."; on Ludlow-street, "trucks, wagons, and carts were standing in filth of every kind from 1 ft. to 2 ft. deep"; "on the west side of Thompson-street . . . were piles of snow, ice, mud, garbage, and general filth from 3 ft. to 4 ft. high, on which trucks and wagons were piled; opposite nearly every door there were overflowing barrels of refuse." One more example of the prevailing state of what we may charitably suppose to be the back streets of the city, will suffice to show the insanitary conditions resulting from Tammany control: "There was a pile of garbage in front of Van Holten & Bay's store at 500, Ninth Avenue; a clerk in the store said that people had to dump the garbage in the gutters because the carts of the Street-cleaning Department did not take it away; he could not remember the last time the block was cleaned." Instances like these are a strange commentary on the vaunted progress of the United States, but it is a pleasure to be able to record that, thanks to Colonel Waring's energetic and methodical work during the last three years, the filth has been cleared away and the streets paved, and that all refuse is now removed at frequent intervals.

When we think of the insanitary conditions so recently prevailing in the chief city of the new world, and even now prevailing in so many towns and cities of Europe, we in England may take credit to ourselves for the progress we have made in the practice of sanitary science. Pioneers in the science, we still hold our lead; experts from all lands come to learn our methods, and to buy or copy our sanitary appliances. Every year we learn something new, and spread it abroad by lecture, pamphlet, and book. To-day we have before us a new work of nearly 400 pages on "The Removal and Disposal of Town Refuse,"* which cannot fail to assist in the progress of cleanliness and in the reduction of disease and death. It is largely a compilation from the writings of engineers and doctors, and from reports to sanitary authorities, but it is a compilation, on the whole, well done, and its author, Mr. W. H. Maxwell, deserves credit for his labour and his skill, as well as for his honesty in mentioning the sources from which he has borrowed. The scope of the book is wide. It includes the legal powers and obligations of sanitary authorities and householders; the scavenging and cleansing of streets; the collection of house-refuse, with incidental remarks on trade refuse; the removal of excrement; the disposal of refuse of all kinds by sorting, tipping, barging, and cremation. Refuse-destructors and their accessories are carefully described, and their use as generators of steam-power is considered with some degree of thoroughness. Chapters are included on tall-chimney construction, water-tube boilers, and thermal storage. Nearly one half the book is occupied by descriptions of the methods of refuse disposal in use in upwards of a hundred towns and cities in this country and abroad. The book is well printed, and seventy-three illustrations and a good index enhance its value.

From this brief outline of the contents, it will be seen that the book merits the consideration of all engaged in sanitary work. It is, indeed, one of the most comprehensive books on the subject which has yet been written. It is, therefore, the greater pity that it is marred by many slight errors, which certainly ought not to have found a place in a book of this importance. Perhaps the most common error is the use of a singular verb after a plural noun; thus (to give a few examples) on page 3 we have "works connected with the removal of refuse . . . is now becoming," &c.; on page 20 the information is given that "the surfaces of paved roadways is also kept cleared of 'slop' by the 'orderly service boys' using 'squeegees';" on page 53 we are told of "an air-tight central tank into which the excreta is drawn by exhausting the air from it at intervals;" a plural verb after a singular noun occurs on page 64, where it is said that "the rural nature of the surroundings afford every facility for the disposal of the pail contents." The derivation of the word "scavenger" is scarcely up to date; it is now generally considered to have come from the Anglo-Saxon "sceawian," through the late Latin "scavagium," the Anglo-Saxon word meaning simply "to show." "Next" is not usually employed in the sense of "preceding," as on p. 161. Inelegant and inexact expressions occur, the use of the relative pronouns being most at fault; thus we find on p. 5, "The terms 'house,' 'trade,' and 'street refuse'

* "The Removal and Disposal of Town Refuse," by William H. Maxwell, Assistant Engineer and Surveyor, Leyton Urban District Council. London: The Sanitary Publishing Company, Limited. 1898. Pp. x., and 372; seventy-three illustrations.

are, however, clearly defined in the Public Health (London) Act, 1891, *and which* interpretation will presently be given;" and on p. 16 Mr. Maxwell discusses asphalt as a paving material in these words: "When kept well cleansed it is not slippery, but it is liable to become so under certain conditions of weather, *and for which* reason should not be laid upon a gradient steeper than 1 in 60." We have always been under the impression that scavengers were appointed for the removal of refuse, but on p. 45 we learn that "refuse is . . . . for the removal of the scavengers!"

In the table on p. 16 there is a printer's error which so entirely destroys the sense of one portion of it, that we could not discover the meaning till we refreshed our memory by looking at the version of the table given in Mr. Boulnois's "Municipal and Sanitary Engineers' Handbook"; in Mr. Maxwell's book, the column in question is headed, "Loads of Mud per Area. Superficial Yards," and whether the figures below are so many loads of mud or so many superficial yards, it is impossible to say. Mr. Boulnois has it, "*Load* of Mud per Area. Superficial Yards," and the meaning is obvious, the figures below being so many superficial yards, and *one load* of mud being obtained from each area, *i.e.*, from 344 superficial yards of macadam, 500 yards of granite sets, 1,666 yards of wood, and 4,000 yards of asphalte.

Mr. Maxwell's attempts at wit and fine writing are, we regret to say, deplorable; the long paragraph on p. 28 should be struck out altogether, and the passage on p. 41 about "the celebrated Mr. Hercules" would be all the better without the attempted smartness. At the same time, a few redundant prepositions may as well be omitted, as in the phrase on p. 166, "filling *in* the interstices in the flags"; there is no necessity whatever for the former of the two prepositions. Ordinary tip-carts, we are told on p. 49, "are heavy, somewhat clumsy, and are usually mounted by the scavenger, plus a ladder"; if this means anything, it means that the ladder, as well as the scavenger, spends its time in mounting the cart! We have drawn attention to these errors, which after all do not in any way lessen the practical utility of the book, for Mr. Maxwell's benefit, so that when a second edition is called for (as probably it will be), he will be able the more easily to remove some of the little blemishes which mar an otherwise good book, and which undoubtedly irritate the educated reader.

The matter of the book is undoubtedly better than the manner, and Mr. Maxwell may be congratulated on having produced a work containing a great amount of useful information. The different kinds of refuse are first considered from the legal point of view, after which "the scavenging and cleansing of streets" receive attention. Major Isaacs is quoted respecting "the essential points for a good pavement," "from a hygienic point of view." The first "point" is that "it must effectually prevent the rising of exhalations from the ground on which it is superimposed;" undoubtedly this is a good "point," if the ground-air can escape elsewhere than into the adjacent buildings. Air-tight paving in crowded localities inevitably compels the ground-air, during periods of rising ground-water, to pass into the neighbouring basements; numerous gas explosions have been caused in this way, the ground air polluted with coal gas from leaking mains having been forced into the buildings, as no other outlet for it was provided. The planting of trees in streets has more than an æsthetic value; the unpaved ground at the root of each tree is a sort of safety-valve, whence the ground-air may escape. This is a point affecting architects, and engineers ought not to be allowed to ignore it.

The cleansing of streets receives careful attention from Mr. Maxwell, but it is somewhat surprising that the regular practice of the "City" of London is not alluded to; any one who passes through the streets of this portion of the metropolis in the small hours of the morning cannot fail to be struck with the odour of carbolic acid, and a little examination will show that the water used for washing the streets contains some quantity of the disinfectant. Mr. Maxwell's proposal to remove the orderly bins, and to substitute for them "suitably-made *hand trucks*," would, we fear, receive scant consideration from the City Fathers. The progress of a "hand truck," receiving contributions of horse-droppings by the way, would be *anathema* to the drivers of vehicles of all kinds in crowded streets like Fleet-street and Cheapside. The pair of light bicycle wheels, with a frame for a movable bag, as used in New York, would be better than a hand truck, as in the former case each sweeper has his own little vehicle, and can, therefore, move about rapidly, whereas the progress of a hand truck receiving the contributions of a whole gang of "orderly" boys would necessarily be slow.

In treating of the collection and disposal of house refuse, the composition and quantity of the refuse are first considered, the quantity in London being between 4 cwt. and 5 cwt. per head per annum, but the amount varies very much in different towns. With reference to the temporary storage of the refuse in or near houses, Mr. Maxwell adopts the current orthodox view in favour of "small accumulations" and "frequent." The portable galvanised-iron dust-bin is considered by him to be preferable to all fixed structures, but we certainly think he might have made an exception in favour of Dr. Quine's "sanitary ashbin" for towns where back streets are the rule. Something also might have been said of the preliminary sorting of refuse by householders, which is now in operation in New York. The ultimate disposal of the refuse is a matter of great difficulty—especially where some system of utilisation is attempted—if all kinds of refuse, from street sweepings and garbage to paper and rags, are collected in the same cart or van. To lessen the difficulty of disposal, Colonel Waring has inaugurated a system of preliminary sorting, which has much to recommend it. Household garbage and ashes are now placed by the householder in one receptacle, and paper, rags, tins, bottles, old boots, carpets, boxes, and wood and metal articles of all kinds, in another receptacle. The garbage and ashes are collected at the same time as the street sweepings and barged out to sea; the other refuse is sorted, and a profit realised on the sales. Another feature of interest in the New York method of collection is the general use of bags, not only for street sweepings, but also for garbage and ashes; by this means the objectionable features of conveying refuse in open carts are avoided.

In reference to the important subject of the removal of excreta, the author favours the water-carriage system in the case of towns, but rightly allows that "the dry-earth closet with a small movable pail and the necessary facilities and appliances for the application of dry earth or ashes" is permissible in rural districts. The disposal of refuse by "utilisation" is then considered, the processes of sorting and sifting in use in this country being described, including the mechanical method of sorting adopted by The Refuse Disposal Company. Additional interest would have been given to the chapter if some of the American systems of utilisation had been mentioned, several of which extract the grease from the refuse.

Rather more than one-fourth of the book is devoted to the subject of Refuse Destructors, a subject on which we have only recently published (August 27) a tolerably exhaustive paper read at the Dublin Hygienic Congress; but descriptions of a great many forms of Destructor will be found in Mr. Maxwell's book, which includes also chapters devoted to tall-chimney construction and water-tube boilers.

The book contains a great deal of valuable information, arranged in an orderly manner, and notwithstanding the small blemishes which somewhat detract from its merit, it will be of service in promoting a knowledge of the difficulties which beset the subject of refuse collection and disposal. The pity is that householders do not take more interest in the matter; if they did, they would aid the engineer by destroying what refuse it lay in their power to destroy, instead of rendering his labours more difficult by sending every waste material, no matter how putrescible, to the dustbin. It is an easy matter for the ordinary householder to reduce the refuse of his house to a very small compass indeed, and it may be useful in this connexion to draw attention to a very useful apparatus which has been recently devised by Mr. Petter of Yeovil. It is simply a closed chamber under the fire-grate of an ordinary kitchen range, and so arranged that the fumes from garbage placed in it for destruction are drawn through the fire above, the products of combustion passing up the chimney. In many places such an apparatus would be a great boon, and would undoubtedly tend to reduce the labours of the Sanitary Authority.

NOTES.

The British Association Address.

OF the two types of British Association Presidential address—the summarising type and the specialist type, the latter has been the more prominent in recent times. Presidents who have made a special record in any branch of science have considered the chair a standpoint from which to review the progress of their own particular branch of scientific research. Sir W. Crookes has reverted to the "summary" type of address, which may in this case be said to deal with all things in Heaven and earth, commencing with "Food Supply" and ending with "Psychic Research"; so that at all events all tastes ought to have been suited. Perhaps the most practically interesting portion of the address is that in which we are promised "salvation by chemistry," or that starvation may be averted through the laboratory. "Before we are in the grip of actual dearth the chemist will step in and postpone

the day of famine to so distant a period that we, and our sons and grandsons, may legitimately live without undue solicitude for the future." For our own part, we have long waited for a new word from science in promise of the production of artificial warmth, when required, by other means than that of compelling various substances to part with their stored-up heat by combustion. We should not be surprised if chemistry were ultimately to prove the best means of enabling us to reach the North Pole, by providing men with both nutrition and heat in ways not hitherto attempted. Perhaps the next British Association President may have something to say on this point.

Dr. John Hopkinson.

ELECTRICAL engineering has suffered a grievous blow by the untimely death of Dr. John Hopkinson. Although his life has been cut short at the comparative early age of fifty years, yet he has left behind him a record of successful work which entitles him to a foremost place both amongst the engineers and the physicists of the century. His early reputation was made by improvements in methods of illumination for lighthouse work. He invented the system of group flashing lights, which has been universally adopted, and he was engineer of the well-known electric lights at Tino, in the Greek Archipelago, and of the Macquarie lights at Sydney. As a practical engineer he was best known by the many ingenious apparatus he invented in connexion with lighting and traction work, and the design of several central stations, of which the very successful one at Manchester is the most important. His most valuable patent was the three-wire system of distribution, a method which is now in use at almost every electric lighting station in the world. Although his time was greatly taken up by professional work, yet he found leisure to communicate many papers containing both experimental and theoretical investigations to the Royal Society, who awarded him a medal in 1890. He was twice president of the Institution of Electrical Engineers, and during his second presidency in 1897, by his tact and firmness, he successfully guided it through a very stormy period of its existence. He also founded the Volunteer corps of electrical engineers, and was appointed its Major by the War Office. On reviewing his work, we are inclined to think that the method he devised of predetermining the characteristic curve of a dynamo was the part of his work that has contributed most to the unparalleled progress of the electric industry. The method, which is described in a paper contributed in conjunction with his brother, Dr. Edward Hopkinson, to the Royal Society in 1886, marks an epoch in electrical theory. It raised dynamo designing from being mere guesswork into an exact science. Dr. Hopkinson, at the time of his death, was acting as consulting engineer to many large electrical undertakings which can ill afford to lose him. There was no engineer whose opinion carried greater weight with electricians, and, with the exception of Lord Kelvin, there was no one whom they more delighted to honour.

The Wellingborough Accident.

ALTHOUGH, of course, the lamentable sacrifice of life and the terrible suffering involved in this catastrophe claim our first and deepest sympathy, it is impossible to reflect upon the sudden destruction of the magnificent Midland express itself without a feeling of sadness. The engine and coaches alike attracted the attention of all who saw the train standing at St. Pancras, or gliding into the stations at which it stopped on its way to Manchester. It was one of the most elaborate and substantially-built trains run on this or any other line, every modern improvement being adopted, and the comfort and safety of the passengers considered in every way. The old question of the desirability of introducing the American "cow-catcher," or some similar appliance, is again revived by this disaster. There are those who advocate a device which would "toss the obstruction on one side"; but it is well to consider what the effect would have been had such an apparatus been in use on this occasion. The trolley would simply have been flung against the side of the platform, rebounding or wedging between the train and the brickwork; and it appears to us that derailment would still have been almost certain to ensue. Although it now appears very uncertain as to the culpability of the boys who were at first supposed to have started the runaway truck, the lesson of the disaster clearly is that no unauthorised person should be permitted to interfere with barrows, &c., except under the direction of officials. It is not at all improbable that such interference is against the rules as it is, for in railway accidents we have become accustomed to find that the cause has been carefully provided against by the company's regulations, but that the particular rule affecting the case has become partially or wholly a dead letter. In this instance, no fault whatever attaches to the unfortunate driver, or any one connected with the working of the train, but the Midland officials cannot afford to neglect the lesson indicated.

Typhoid Fever at Maidstone.

THE three Local Government Board Inspectors appointed to inquire into the recent terrible outbreak of typhoid fever at Maidstone have now issued their report. In their opinion, the epidemic was undoubtedly caused by the pollution of the Farleigh branch of the water supply, but at the same time they condemn the Town Council for having made no attempt to remedy the insanitary conditions prevailing throughout the town. There can scarcely be two opinions as to the dangers of leaky sewers and drains, and of crowded cesspools, but the attempt made at the time of the epidemic to throw all the blame on the sanitary defects of drains, sewers, and cesspools, was, as we pointed out in our issue of March 18, 1898, based on a partial view of the case. Typhoid fever may, it is well known, be air-borne, but at Maidstone the facts of the simultaneous outbreak of the disease over a wide area, and of the rapidity of its spread in that district which was supplied with water from the Farleigh sources, certainly points to this epidemic being another example of water-borne disease.

A Clergyman on Sewage Disposal.

A WEEK ago the *Times* contained a letter from a high dignitary of the Church of England, which, for naïve ignorance, would indeed be difficult to parallel even in the columns of the daily Press. The Rev. J. W. Sheringham is the writer of the letter, and is also "Archdeacon and Canon of Gloucester." He is under the impression that the only "palliatives on which we place our reliance" for purifying sewage are those "miserable subterfuges indeed—sewage farms," and that his plea for "the cremation of sewage"—or rather, as he afterwards explains, the "solid matter" in sewage—is an entirely novel suggestion! "I plead," he says, "for the erection of huge furnaces at the outfalls of our drains; no doubt they would require lofty chimneys and chemical ingredients to neutralise the noisome gases, but this, surely, cannot be beyond the reach of science. In these furnaces the solid matter would be burnt and form artificial manure; the liquids, being properly filtered and deodorised, might then be allowed to flow away." Perhaps Archdeacon Sheringham will explain what is the manurial value of sewage sludge, after it has been burnt in a "huge furnace"? At places such as Ealing and Leyton, where the Archdeacon's suggested processes are in actual operation (but, of course, without the "chemical ingredients to neutralise the noisome gases"), the officials would be only too glad to find farmers willing to purchase the "clinker," which is all that remains from the burnt refuse. With the Archdeacon's intentions, however, we are in entire sympathy; his remarks on the hideous pollution of our streams are not a jot too strong. The gradual awakening of all sections of the public to the necessity for more stringent regulations as to the pollution of streams is indeed a sight to make the heart of the true sanitarian rejoice; and we trust that Archdeacon Sheringham will continue to take a keen interest in the purification of the rivers of our country; but his influence will be all the greater if he will first undertake a short course of reading on the subject.

Vauxhall Bridge.

THE materials of old Vauxhall Bridge are offered for sale. It is the first iron bridge across the Thames in London that was opened for traffic (June 4, 1816); the first stone of the pier begun by Rennie was laid by Lord Dundas, as the Prince Regent's proxy, on May 9, 1811. By reason of certain disagreements, four engineers were concerned in its design and construction. The original designs by Ralph Dodd for a stone bridge of nine arches, with a 78 ft. span, were approved in 1809. Rennie succeeded Dodd, and was in turn superseded by Sir Samuel Bentham. Finally, James Walker was appointed by a public company to complete the work, which was resumed in 1813—the stone being laid on August 21, by the Duke of Brunswick, the same who fell at Quatre Bras. For economy's sake Walker adopted iron arches, but carried up the stone piers whose foundations had already been laid. The eight piers are 13 ft. wide, the middle arch rises to 27 ft. above high water: the bridge is only 36 ft. wide. It was intended that it should be called Regency Bridge, but local associations prevailed and it soon took the name of the adjoining Gardens, which were not finally closed until forty years ago. The total cost amounted to 300,000*l.*, with 70,000*l.* more for legal expenses. The late Metropolitan Board of Works bought the bridge for 255,230*l.*, and opened it toll-free on May 24, 1879. The old Vauxhall turnpike stood about 90 yards from the bridge's east end. Some observations upon the design, with

illustrations of one of the piers, &c., and the cast-iron balustrade railing, will be found in a paper on "London Bridges: Architecturally Considered," read at the Architectural Association by the editor of this journal, and printed in our issue of February 23, 1895.

Highgate Archway.

THE rebuilding of the Archway, after the designs of Sir Alexander Binnie, Engineer of the London County Council, is making progress. Mr. C. Wall's tender for 25,126*l.* was accepted, and the work will be completed in eighteen months hence. The bridge, of steel and cast iron, will have Portland stone, concrete, and brick abutments, and it is stated that certain parts of the former fabric are to be incorporated in the new structure. The span will be 120 ft., the width between the parapets is 40 ft., whereof 16 ft. are allotted to the two footpaths. The old Archway, built of brick and stone, rose to 65 ft. from the roadway to the vault of its upper arch; that height was divided into two stories, as it were, the lower one being 36 ft. high, by 18 ft. wide, and having, it is said, the main and three minor arches turned underground just as they were turned above. It was made to carry Hornsey-lane across the cutting of Archway-road. In order to relieve the steep ascent of the Great North-road up Highgate Hill a scheme was propounded in 1809, by Robert Vazie, to divert the traffic by making a tunnel 24 ft. by 18 ft. high and about 1,080 ft. long through the hill of ferruginous clay. The Highgate Archway Company obtained an Act in the following year, and adopted Rennie's proposal for a tunnel 765 ft. in length (to be reduced to 633 ft. if the funds allowed) joining two open cuttings of 135 ft. and 174 ft. respectively. But in April, 1812, the works fell in, after 390 ft. of tunnelling had been bored, so it was decided to make an open cutting throughout. The works, including the approaches, cost nearly 104,000*l.* The archway, inscribed "GEO. AUG. FRED. WALLIAE PR. REGIS SCEPTRA GERENTI," was opened on August 21, 1813. The Hope Insurance Company bought the undertaking in April, 1819. In 1876 the tolls on the Archway-road were abolished for a composition of 9,000*l.*, in terms of the Holyhead Road Relief Act, 24 & 25 Vict., c. 28. Ten years ago Mr. T. de Courcy Meade, then Surveyor to the Local Board of Hornsey (from which parish the Archway's middle line separates the parish of Islington), prepared several sets of alternative plans for a new bridge of brick and stone. The old building, which possessed some dignity and character of design, was once esteemed more highly than now, insomuch that people would make considerable journeys to see it. The new bridge will be maintained as a "county bridge" at the joint expense, in equal shares, of the London County and Middlesex County Councils; the Ecclesiastical Commissioners contribute 1,000*l.* to the cost, the remainder being paid, in equal shares, by the two Councils, the Vestry of Islington, and the Hornsey Local Board.

The London Library, St. James's-square.

THE library premises in the square's north-western corner have been re-built (with an elevation of Portland stone) by Messrs. William Cubitt & Co., of Gray's Inn-road, from the plans and designs of Mr. Osborne Smith. To the former house, known as Beauchamp House, and then numbered "12," the Library migrated, in 1845, from No. 46, Pall Mall, where it had been established in 1841. In 1879 the Committee bought, for 21,000*l.*, the freehold of the house in St. James's-square, and of some premises entered from Duke-street in the rear. The London Library was established in July, 1840, by Carlyle, Gladstone, Lord Macaulay, Sir Arthur Helps, J. Spedding, and other famous men of letters, Lord Lyttelton being the first President.

The High Building Plague in Paris.

IT is proposed to erect a very tall "Maison de Rapport," which is called in London a House in Flats, at the corner of Rue du Sommerard and Rue de Cluny in Paris, which will entirely crush the Cluny Museum and hide its façade from general view. The matter has not passed without protest (for in Paris the public and the Press take some interest in such matters), and the Minister of Fine Arts has called on the Prefect of the Seine to bring the matter before the Municipal Council. It appears, however, that the only remedy will be for the City to make a compulsory purchase of the land "pour cause d'utilité publique," at a price to be settled by a jury, and convert it into a public square. This course would have the effect of opening the façade not only of the Cluny Museum but that of the new Sorbonne also.

St. Giles, Cripplegate, and Milton.

A PROJECT is set on foot to lay out this burial ground as a public open space, and to erect therein a memorial to Milton. The poet was buried in, or next to, his father's grave, within the church. Aubrey says, "at the upper end of the chancel, at the right-hand"; whilst the exact spot is now unknown, the story that the remains disinterred in August, 1790, and publicly exhibited, were his, is no longer credited. On quitting Chalfont St. Giles, upon the cessation of the Great Plague, Milton returned to the small narrow-fronted house in Artillery-walk, Bunhill-fields (since absorbed into Bunhill-row) where he passed the last eight years of his life. In the church is his bust by John Bacon, the gift (1793) of Samuel Whitbread—it was placed within a canopy in 1862. The churchyard level has been considerably raised by interments during the Plague, it is bounded on one side by a bastion and part of the City wall whence the battlements, shown in the old prints, were wantonly removed in 1803, at the parishioners' expense. It may be added, in connexion with the subject, that of Milton's many homes in London not one is now standing. The researches of Professor David Masson go to show that the poet's garden-house in Aldersgate-street (1640-5) stood on the east side of what was then garden-ground behind the houses between Lamb-alley (afterwards Maidenhead-court) and the later Shaftesbury-place, on the street's east side. The house in Barbican was pulled down in 1865; and Jewin-street has been altogether rebuilt since Milton's day.

Vandalism at Mont St. Michel.

MANY protests have been made, during the last few years, against the dyke or mole from Pontorson, on the main land, to Mont St. Michel. It is, however, undoubtedly useful, and not seriously injurious to the appearance of the place. But a scheme has been proposed by M. Cochery, the last Minister of Finance, which is really scandalous; viz., to establish a casino and various popular attractions at the foot of the ramparts beneath the great Mediæval building. It seems incredible that such a thing should be even proposed, but it appears to have its supporters; though the Conseil-Général de la Manche, as well as M. Selmersheim, the Inspecteur-Général of "Monuments Historiques," have protested energetically against it. Mont St. Michel has suffered enough under the hands of the restorer (and with the concurrence of the "Monuments Historiques" authorities); this would be the last and crowning degradation. But one can hardly think it possible that such a thing can really be allowed.

The Salons and the 1900 Exhibition.

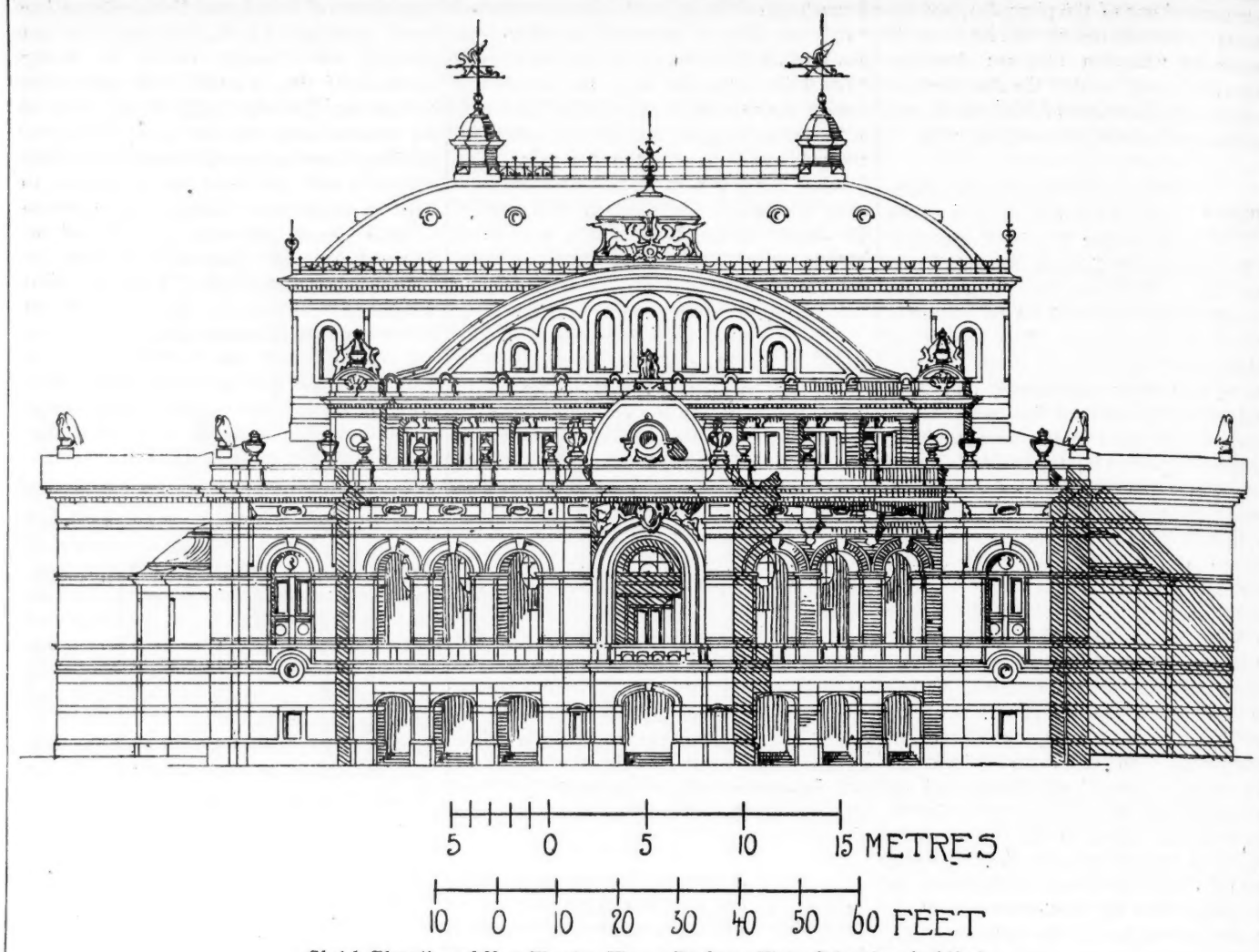
IN a Note on this subject last week, recording the protest of the Directors of the New Paris Salons against the inadequate size of the Fine Art Palaces for the exhibition, we suggested that a compulsory reduction in the number and size of the pictures exhibited would be no injury to the annual Paris exhibitions. Our contemporary, *La Construction Moderne*, in its issue of September 3, expresses the same opinion in much stronger language. If the French artists, it is observed, would remember that a Salon is a Salon and not a "Magasin des Décors," they would not send works requiring a place as large as a railway station to hang them; and if it is demonstrated that the linear wall space in the new buildings is considerably less than in the galleries which the new exhibitions have been accustomed to, our French colleague can only rejoice that in future they will be spared the "ahurissement" and the "douleurs de tête" caused by these enormous collections of pictures; and adds:—

"Quant aux artistes, notre non moins sincère avis est qu'ils y gagneraient, tout comme leur exposition. A l'heure actuelle, si l'on veut être impartial et juger sans intérêt, sans parti pris, il y a, dans chaque exposition, un tiers d'œuvres qui sont indignes d'y figurer; un tiers d'œuvres médiocres dont on ferait mieux d'épargner la vue au public; un tiers enfin qui mérite d'être exposé."

This is just about the truth of the matter, as far as the paintings are concerned; we do not know that the same judgment could quite apply to the sculpture.

Drawings Without Owners' Names.

WE have had to insert a paragraph on our "Illustrations" page asking for the name and address of the owners of some brass rubbings and other drawings, which we are unable to return from the want of any indication of ownership. We may take this opportunity of drawing attention to the trouble which is caused to us, and the risk of loss to the owners of drawings, from the frequent practice of sending drawings without any name or address on them to show whose they are, and often without even a title to show what they are. Some people seem to think it is quite sufficient to write by a separate post that they "are sending drawings of so-and-so," leaving it to the editor to identify them by comparison with the letter; forgetting that the drawings will probably not arrive the same day as the letter, or that two or three sets of drawings, all possibly without owners' names, may be delivered here at the same time. Every



Sketch Elevation of New Theatre, Kiew. Professor Victor Schroeler, Architect.

drawing sent to the office of a paper should have the title and the owner's name and address written legibly on the margin or at the back. Senders of MSS. are usually careful about this; why senders of drawings, which are often more valuable than MSS., are so careless we cannot understand.

THE NEW MUNICIPAL THEATRE AT KIEW.

WE have on a former occasion referred to the International Competition held under the auspices of the St. Petersburg Architectural Society, with the view of obtaining a suitable design for the new municipal theatre at Kiew. The decision of the assessors, as we have already reported, was in favour of a scheme proposed by Professor Victor Schroeter, who holds the post of Architect-in-Chief to the Imperial Theatre Administration, and besides having recently reconstructed several of the Czar's playhouses, also has a considerable private practice. Some two years ago we published a view of Professor Schroeter's new theatre at Tiflis, in the Caucasus*, and also some drawings of the new Imperial Opera House which the Czar proposes erecting in the capital, and we now give an elevation and plan of his design for the Kiew theatre, which is in process of construction.

The plan has been laid out on the so-called "Radial" system, with a curved front indicating the position and shape of the auditorium; it is well laid out for ingress and egress, and shows that considerable attention has been paid to the safety of the audience in case of fire. The placing of the staircases either side of the principal lounge has enabled the architect to make them a feature in the external design.

The elevation is to be of red brick with freestone facings. The house provides accommodation for an audience of 1,500 and an orchestra of seventy. The expenditure is limited to 450,000 roubles.

* See *Builder*, November 21, 1896.

NOTES ON THE DESIGN AND ERECTION OF ARCHITECTURAL IRONWORK.*

DURING the last few decades considerable changes have taken place, not only in the design but in the details of construction of public buildings and business premises.

The changes have, no doubt, been principally brought about by the enormous value of land in cities and towns, the increased demand for window space, and the necessity for so-called fire-proof construction.

The great prices demanded for building sites make it incumbent upon architects to provide the largest amount of accommodation in the smallest possible space, which means increasing the height of buildings and diminishing the walls and piers to the smallest possible limits.

The demand for window space considerably diminishes the area of the external walls of buildings, and necessitates the use of other material than brick and stone to ensure stability.

The demand is brought about partly by the close packing of buildings and their increased height, partly because the buildings principally referred to are used for business purposes only (in which case abundance of light is necessary), and partly by the requirements of sanitary science.

The demand for fire-proof construction makes it necessary to use non-inflammable material wherever possible, and in many cases calls forth considerable ingenuity of design to prevent the spread of fire from one part of a building to another.

The great development which has taken place in the manufacture of iron and the consequent lowering of its cost, has made possible the many changes in construction necessitated by the changes in design, and has left the architect free and untrammelled by the want of a suitable material.

Many of the most important bnildings of to-day are virtually iron structures clothed with brick, stone, or other building material, and not only require architectural skill in their design, but the scientific knowledge of the engineer to construct the framework on which the design is hung.

* A Paper read by Mr. Henry A. Cutler, Assoc.M.Inst. C.E., City Engineer of Cork, at the Dublin Congress of the Royal Institute of Public Health (Engineering and Building Construction Section).

The materials principally used for the framework of buildings are cast-iron, wrought iron, and steel, the determination of which material to use in any particular case depending upon the skill of the designer, the cost, and other circumstances of the particular case under consideration.

As a general rule, it may be taken that cast iron is not the most suitable material where it would be subject to transverse stress or tension, but that it is the most suitable material in direct compression within certain limits.

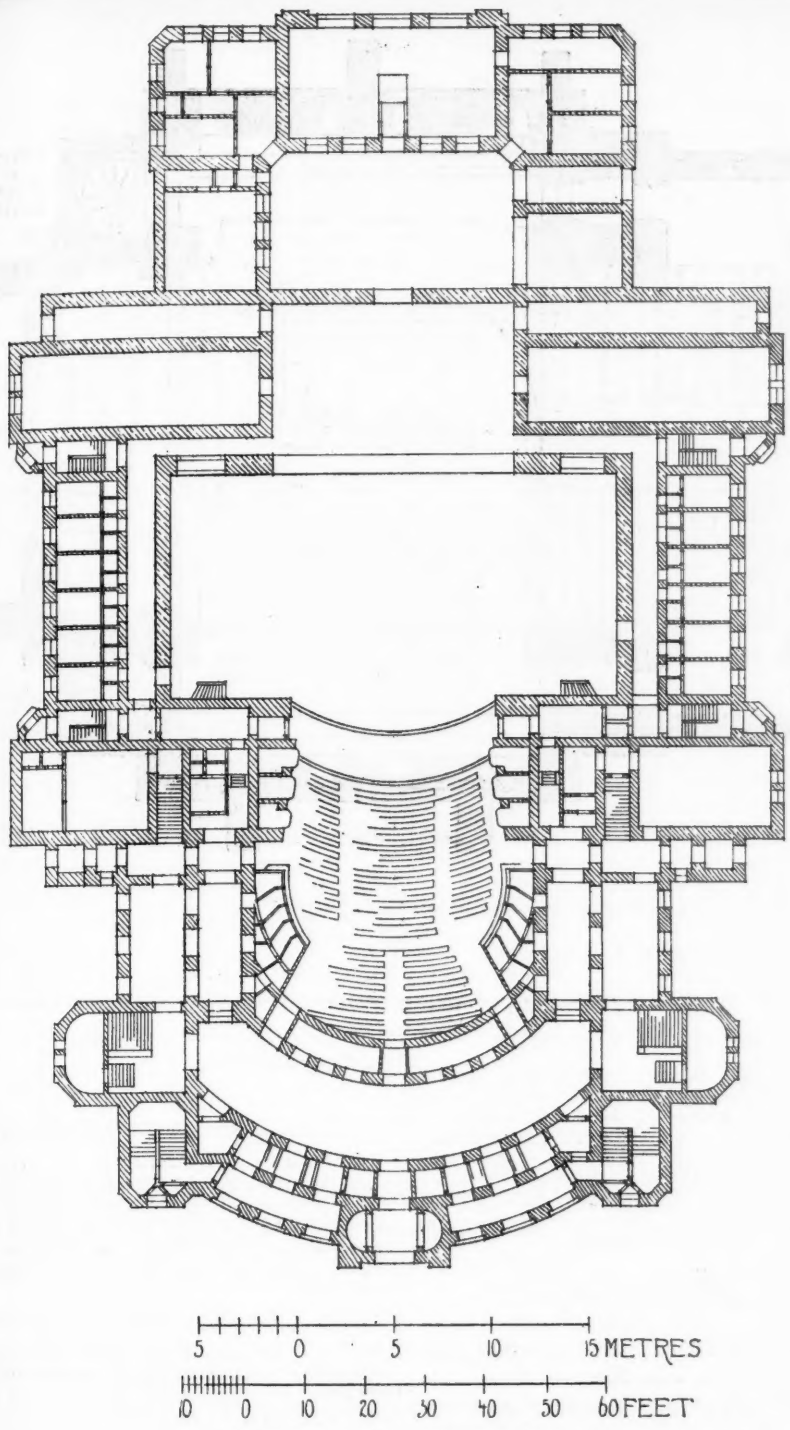
Wrought iron and steel may be used under any kind of stress, but where strength only is to be considered, it is possible to use lighter sections with steel on account of its greater strength.

In using girders of small depth in proportion to the span, the flexibility as well as the strength must be determined, and there may occur cases where very little advantage would be obtained by the use of steel, as a heavier section might have to be used than required for strength to prevent undue deflection.

The ultimate strength of iron and steel varies considerably, but the figures in the following table may be taken in ordinary practice :—

—	Tensile Strength.	Crushing Strength.	Clearing Strength.
	Tons per square inch.	Tons per square inch.	Tons.
Cast Iron	7	36	8
Wrought Iron	22	16	20
Steel	32	30	24

The working stresses should in no case exceed one-fourth of the ultimate strength, and in the case of stancheons for warehouses or supporting machinery or where shocks may be expected, a larger factor of safety should be used.



Sketch Plan of New Theatre, Kiew.

The safe bearing stress to which materials may be subjected may be taken as follows :—

Cast Iron ... ... 8 tons per square inch.
Wrought Iron ... 5 " " "
Steel... ... ... 7½ " " "
Brickwork in mortar ½ cwt. " "
Brickwork in cement ¾ " " "

The most general sections for pillars are the hollow circular column. The hollow square column, the "H" section and modifications of the same, the cruciform section, the solid circular section, and the solid square section, all of which can be manufactured in either cast iron, wrought iron, or steel.

In designing pillars the form of section is not always of moment, and it becomes a question which section will be the most economical.

To save preliminary calculations in such cases, the author has calculated the strength of a hollow column 10 in. in diameter with metal 1 in. thick, and compared the same with the calculated strength of pillars of the sections previously mentioned, designing them with the same length, area of section, and (except in the case of the solid round and square sections), the same thickness of metal so that the weight of metal would be the same in each case.

The results of the investigation are given in the following table of relative strengths, the calculations being made on the assumption that the pillars are of cast iron rounded at both ends.

The arbitrary value of 100 was given to the hollow column to which the values for other sections are related according to their strength.

Section.	Relative strength	Section.	Relative strength.
○	100	+	25
□	85	⬮	23·3
H	51	▣	23

If the pillars were of wrought iron or steel, the relative strengths would be in the same order as for cast iron, and would vary but little from the values given in the tables for cast iron.

Although the hollow round and hollow square columns prove to give a far more economical distribution of metal than any other section, it must not be forgotten that it is impossible to properly calibrate the thickness of metal in castings of such sections, that they may be badly cored in their manufacture, giving more metal on one side than another, and that the unequal thickness considerably lessens the strength of the column.

The author is of opinion that a considerably larger factor of safety should be used with castings which it is impossible to measure and examine in every part than would be necessary with other sections.

Pillars may fail by the crushing of the material of which they are made, which occurs with pillars that are short compared with their radius of gyration ; by flexure, which occurs with long pillars, or by a combination of both ; but no hard and fast line can be drawn between failure by crushing and failure by flexure. With short pillars the material which has the greatest unit-crushing strength will give the most economical results as regards weight, but in pillars failing by flexure the strength depends upon the modulus of elasticity of the material.

From the foregoing remarks, it will be seen that the length of a pillar may have a great deal to do with the selection of the material of which it should be made, for which purpose the following table may be of assistance, as it gives the different material in order of strength for different proportions of pillars. As an instance of the use of the table for a pillar, the length of which divided by the radius of gyration is between the limits of 1 and 50, the greatest unit strength would be obtained from cast iron, steel coming second, and wrought iron third.

Pillars with Ends Rounded.

Length Divided by Radius of Gyration.	Materials in Order of Strength.		
1 to 50	Cast Iron	Steel	Wrought Iron
50 to 60	Steel	Cast Iron	Wrought Iron
60 to 300	Steel	Wrought Iron	Cast Iron

Pillars with ends fixed.

Length divided by radius of gyration.	Material in order of strength.		
1 to 80	Cast iron	Steel	Wrought iron
80 to 100	Steel	Cast iron	Wrought iron
100 to 300	Steel	Wrought iron	Cast iron

When pillars carry girders, mistakes are often made in designing the seats, and it cannot be too strongly urged that the loads transmitted to pillars should be carried as near the centre of gravity of the section as possible.

The provision of girder seats, far too large for the weight to be carried, is a common error, and frequently is a source of danger, because the deflection of the girders carried cause all the weight to be thrown on the outside of the seat, and removes the centre of gravity of the load considerably away from the centre of the pillar, a condition for which it has never been calculated.

In designing the seat for a girder it is only necessary to have sufficient bearing area to prevent the safe bearing stress of the material of which the girder or the seat is made being exceeded, calculating of course on the safe bearing stress for the weaker material.

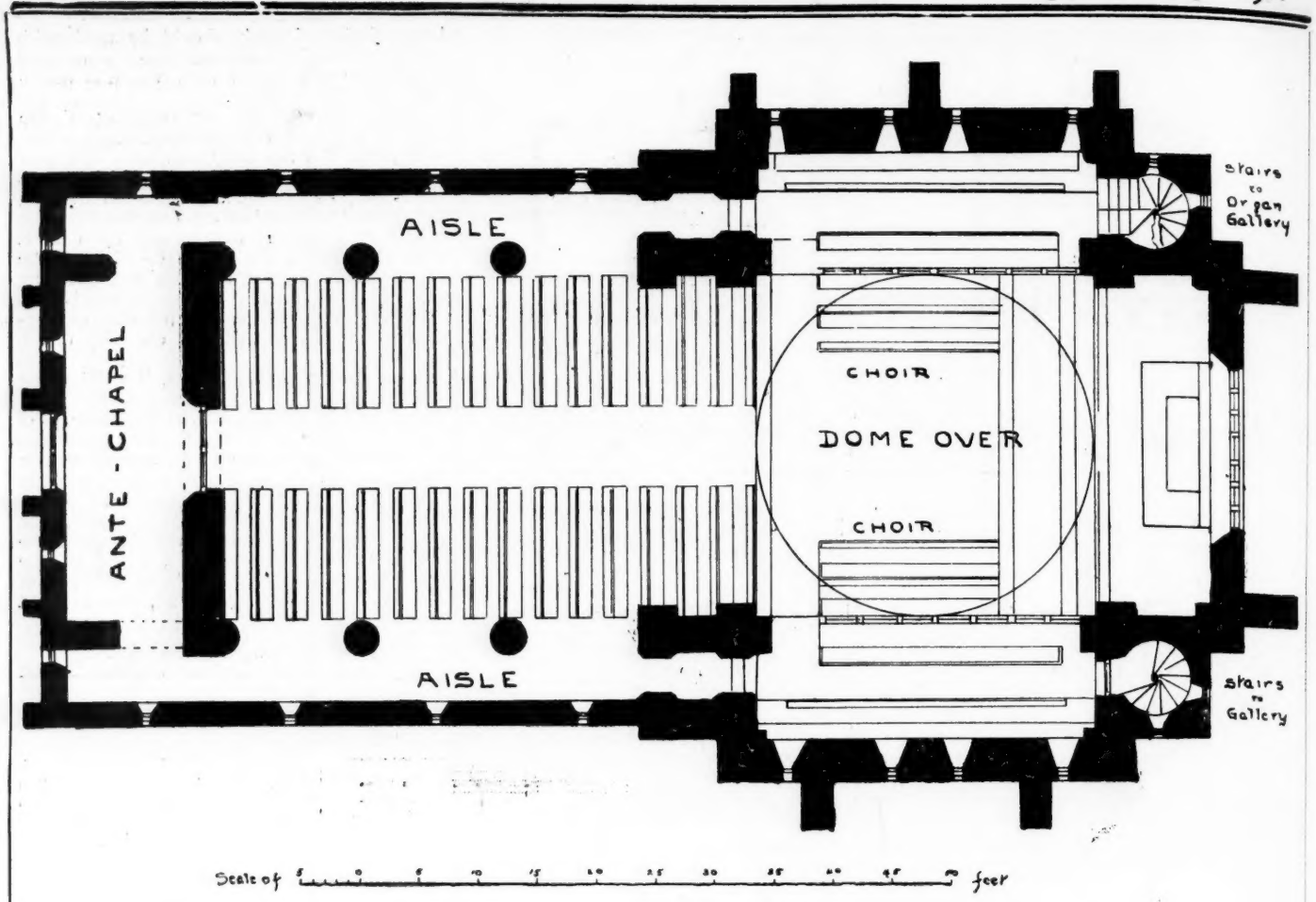
In the erection of ironwork care should be taken that girders are properly secured to stancheons or other girders which they intersect, and in most cases it is better to make use of the ends of the girders for fastening rather than securing the flanges to their seats.

It is also better practice to depend upon the clearing strength of bolts and rivets than to put them in direct tension and allow the load to be suspended from heads and nuts.

In designing the ironwork for a building it is also a matter for consideration as to what extent the framing will be required to brace the structure besides supporting vertical loads, because where lateral security is required it will be necessary to properly anchor the bases of the pillars, and in some cases make use of diagonal bracing.

In fixing the sizes of bolts to be used in securing one pillar above another and securing girders to cast-iron pillars, it is better to err on the side of safety, and it may be laid down as a rule that 1½-in. bolts are the smallest that should be used, except with small girders or in special cases.

In bedding girders on iron seatings a strip of lead may be used, but where a girder or pillar is supported upon a stone template the safe unit stress is small in comparison, and some



Chapel, Giggleswick School. Plan.

material with considerably less resistance to crushing should be used between the surfaces.

As the strength of a stancheon largely depends upon the way in which it is fixed, a doubt often exists in the mind of the designer as to what assumption shall be made in calculating its strength; that is to say, whether he shall consider both ends to be rounded, one end fixed and one rounded, or both ends fixed, the relative strength of pillars fixed in the ways described being 1, 2, and 3 respectively.

Even when one is warranted in assuming fixity of one end or both, careless workmanship will often upset all his calculations.

In calculating pillars with flat bases, but supporting other stancheons or girders subject to a variable load, the author assumes one end to be fixed and the other rounded, but stancheons carried on others he assumes to have both ends rounded. The only cases in which he would consider both ends to be fixed are where both ends of the pillar are flat, and where the load supported is constant and evenly distributed.

For bedding a pillar the best plan, perhaps, is to make the vertical distances between the stone template and the load which the pillar is to support about 1½ in. greater than the length of the pillar. Then wedge the pillar up to its position by driving iron wedges between the template and the base of the pillar, grouting the space with neat cement.

If pillars are bedded in the way described, it is unnecessary to machine-face the base, but holes about 2 in. in diameter should be left in the base plate as near to the centre of the pillar as possible, so that the grout which is poured in from the outside between a raised mound of clay and the base will rise in the grout holes and indicate when the space is properly filled.

The top of a cast-iron pillar supporting another should be machine-faced.

Wherever ironwork is used in a building it should be covered with fire-resisting material so as to protect the supporting framework of the structure as long as possible from the influences of heat.

Many kinds of fireproof flooring are in the market, but the author would give preference to floors where the whole of the ironwork is properly protected from fire by some suitable covering.

UNCLAIMED DRAWINGS.

WE have on our table four sheets of rubbings of ancient brasses with no name or address on them. The owner of them will oblige by sending his address for their return; otherwise they must be destroyed. We have also a drawing of the Wolvesey Palace, Winchester, with the signature of "James B. Nicol," but no address.

Illustrations.

NEW CHAPEL, GIGGLESWICK SCHOOL.

THE new chapel, of which the memorial stone was laid on October 7, 1897, occupies a site on a knoll of sandstone rock that rises steeply above the school buildings; from its position it will be a conspicuous object from the surrounding country in nearly every driection.

The plan, which is appended, consists of a Latin cross, with a dome over the crossing, surrounded at the four angles by turrets, which are crowned by small cupolas. The choir is placed under the dome, and the shallow transepts contain each a gallery, that in the north transept being intended for the organ. The school will occupy the nave, which is lit by a lofty clearstory, and has a narrow and low aisle on each side for access to the pews.

The materials will be chiefly local stones of various kinds, including a black limestone, which will be used in bands and chequers with the lighter-coloured masonry, and a red sandstone from Egremont.

Owing to the rapid fall of the ground, height is found under the chancel for a vestry, which will be reached by a stair in the north-east turret.

The dome will be of concrete and terra-cotta, with a wooden covering laid with sheet copper, and is to be surmounted by a stone lantern and a cross of gilded metal resembling those on oriental churches.

The architect is Mr. T. G. Jackson, R.A., and the work is being carried out under his direction without a contractor by Mr. R. Evans, his clerk of works.

The chapel will be heated with hot air by Messrs. Haden, of Trowbridge.

The drawing occupied a central position in the architectural room at the last Royal Academy exhibition.

FAÇADE OF A TOWN HOUSE.

THIS is a design for a small house in a London street, the ground and first floor plan of which are appended. The materials proposed were red brick and Portland stone; the roof to be covered with green Westmoreland slates. The drawing was exhibited at the Royal Academy this year.

NOS. 81 AND 82, FRIAR-LANE, LEICESTER.

This is a sketch elevation for a suggested rebuilding; the materials to be red brick with Weldon stone dressings; the top story to be rough-cast, with a slate roof.

M. STARMER HACK.

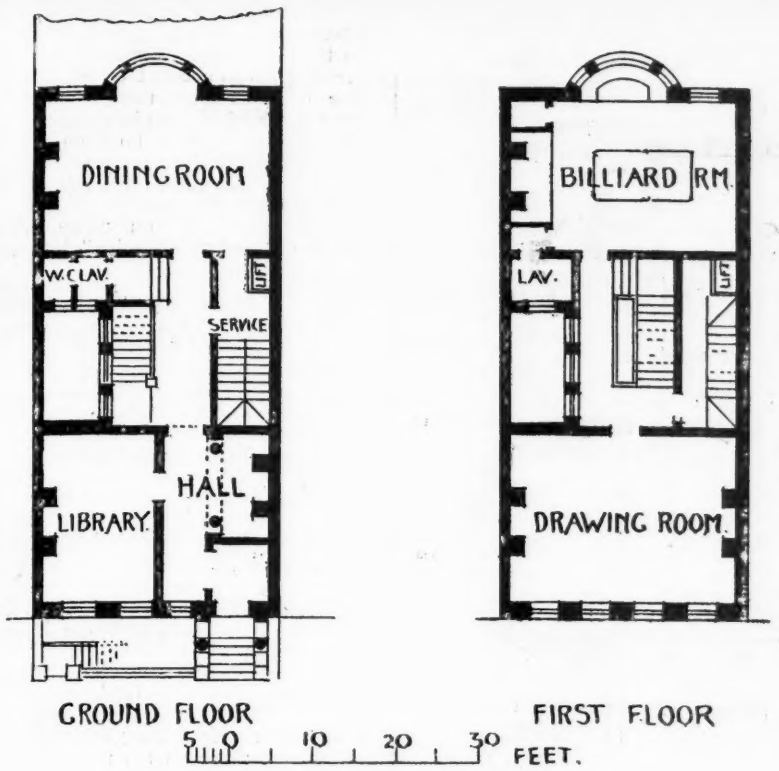
CLIFF TOWERS.

THE illustration which we publish of the above house, of which Mr. C. Harrison Townsend is the architect, represents the porch and a portion of the entrance front. The dwarf tower here shown is a *motif* which is repeated at the four corners of the building, which is so planned that all the rooms (which face the south and command a view of Salcombe Estuary) open out of wide ground and first-floor corridors or galleries on the north side. Two of the windows are seen in the illustration. The material of which the house is built is a local stone, which has a very pleasant grey-green colour, and the roof and vertical covering to the wall and towers are green Tilberthwaite slate.

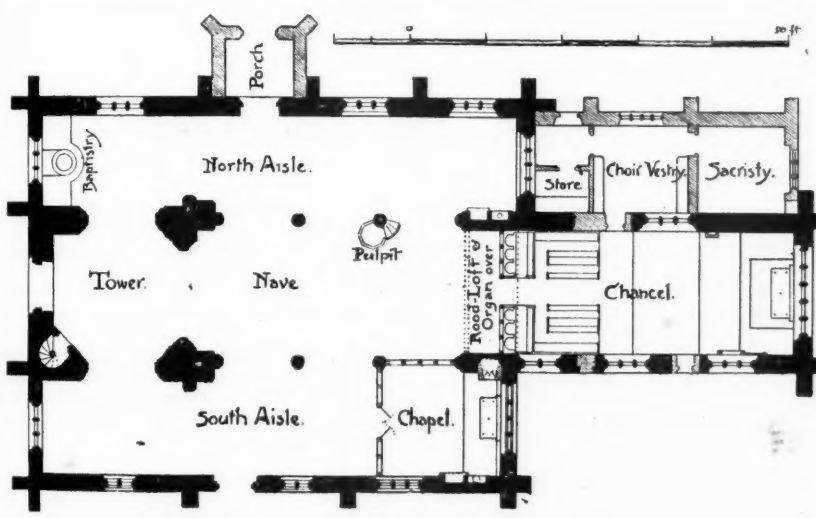
The drawing was exhibited at the Royal Academy of this year.

NEW ALTAR, ST. MARY'S, CHADDESDEN, DERBY.

THIS church, which is dedicated to St. Mary, suffered much at the hands of zealous restorers in the fifties and later. It is in the Decorated and Perpendicular styles. The chancel is the oldest portion, and was originally a chapelry of an adjoining parish. The modern roofs are open. The greater portion of a fine fifteenth-century screen with remains of re-turned stalls, piscinæ, and sedilia, and a stone gospel-desk on the north chancel wall, still exist.



A Town House. Plans.



St. Mary's, Chaddesden. Plan.

The scheme proposed comprises the construction of the upper portion of the screen, with rood and organ-loft over, and the opening up of the old rood stairs; a new reredos to the altar; the erection of a new altar, &c., in the south aisle, and a screen to form a chapel; the removal of the organ-chamber to make room for the vestry, &c., without blocking up any existing windows; a slight readjustment of steps in the chancel; the reconstruction of the north porch, which has ceased to exist; and the return of the priests' door to the position further east, from which it was removed in the sixties.

The pulpit at present stands against the chancel screen. The church contains several stained-glass windows of indifferent modern design.

Mr. H. Rose is the architect.

The drawing was exhibited at the Royal Academy of last year.

ST. BARTHOLOMEW'S CHURCH, SOUTHSEA.

THE works already carried out at the above church consist of transepts, chancel, morning chapel, and vestries. The materials used are red brick with red terra-cotta dressings externally, the roofs being covered with green Westmoreland slates, red terra-cotta is also used for the arches and ornamental string courses internally, but the whole of the walls and ceiling are plastered, which is to be decorated with fresco when thoroughly dry. The screen will be of cream-coloured marble and alabaster with dark marble inlays and columns. At a future date it is intended to rebuild the nave with columns and aisles, also to add a baptistry, and campanile for clock and bells. The contractor for the works is Mr. Quick, of St. John's-road, Southsea, and the clerk of works Mr. Mansel, of Gosport; the architects are Messrs. W. A. Coombs & E. Towry Whyte, of London. The drawing was exhibited at the Royal Academy of last year.

"PRIX DE ROME" PRIZE DRAWINGS.

THE illustrations on this sheet are from three of the designs of the "Prix de Rome" students of this year, at the Ecole des Beaux-Arts, Paris.

The architectural design is that which gained the Grand Prix de Rome for architecture, and is by M. Léon Chifflot, a pupil of MM. Daumet, Girault, and Esquié; the subject being "A Palace for entertaining the illustrious guests of France." A photograph of the plan was also forwarded to us, but on a much smaller scale and too weak a photograph to reproduce from. The design shows the usual scholastic quality which is in favour at the Ecole des Beaux-Arts—too much in favour, most English architects will think; but it is probable that a competitor who ventured outside these academical lines would have little chance of the prize.

The painting illustrated is that which obtained the Grand Prix for painting, and is by M. Gibert, a pupil of M. Gerome. The subject is the descent of the angel at the pool of Bethesda. It should be added that this year the jury awarded a special "Second Grand Prix" to M. Lamarra, pupil of MM. Lefebvre, Bouguereau, and Tony Robert-Fleury, for his treatment of the same subject, as it was considered so nearly equal to that of M. Gibert that there was a difficulty in deciding between them.

The sculpture subject is that which obtained the "Second Grand Prix" in sculpture, and is by M. Boucher, a pupil of MM. Falguière and Mercié: the subject is "Cain, after the death of Abel, hears the curse of the Almighty." The photograph of the Grand Prix in sculpture, by M. Alaphilippe (pupil of M. Barrias) we have not been able to obtain.

MAGAZINES AND REVIEWS.

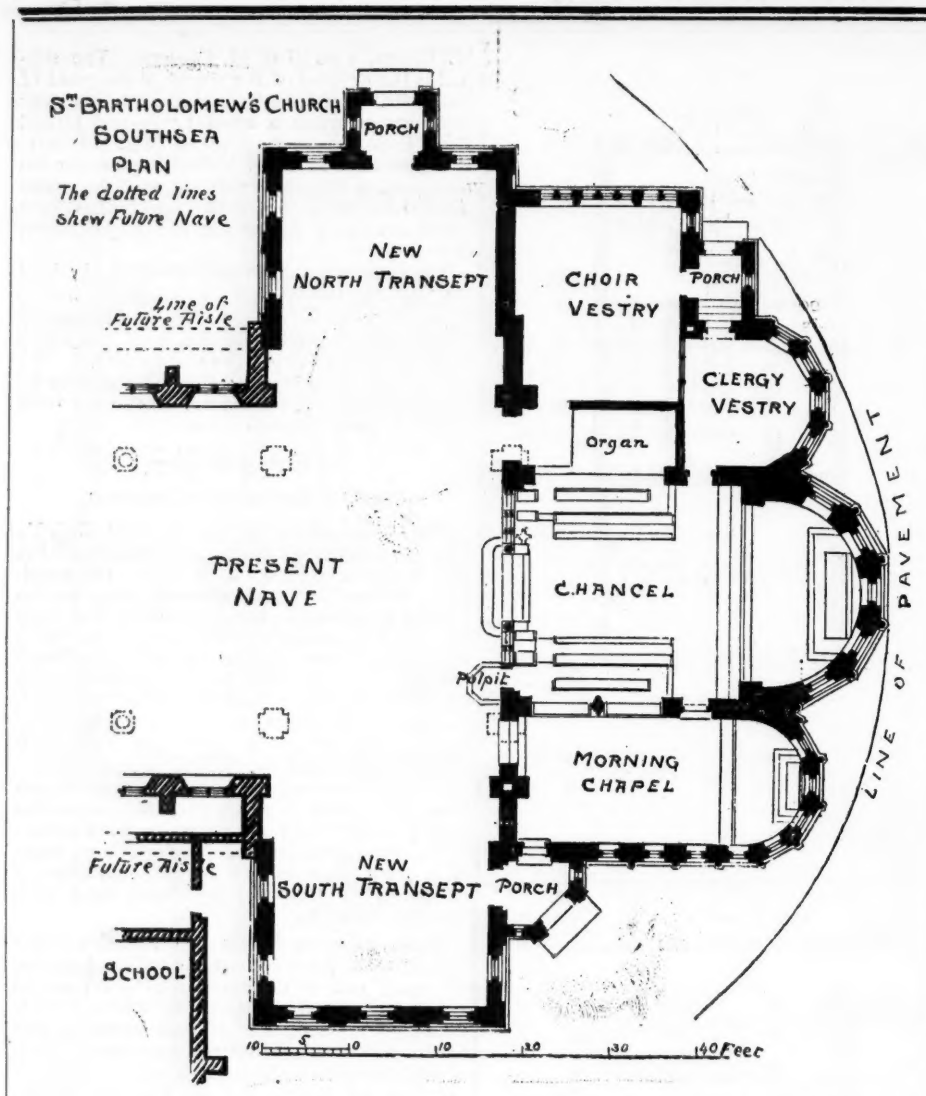
The *Architectural Review* (Boston), Vol. V., No. 5, contains elevations and details of the City Hall at Binghampton, in which the architects, Messrs. Ingle & Almirall, have endeavoured to persuade the inhabitants that they are living in a suburban district of Paris. From that point of view, the work is refined and well studied. Mr. Russell Sturgis contributes a paper on "Common-sense Planning" in which he appears to deprecate all consideration of balance and effect in plan, and regards it merely as the most convenient arrangement of rooms and doors and windows as they happen to come. What is really required at present (in this country at least) seems to be a protest in the opposite direction. The crowning merit of a good plan is not to set symmetry at defiance, but to make symmetry and convenience coincide.

The *Gazette des Beaux Arts* includes a long article by M. Jules Momméja on "La Jeunesse d'Ingres," one of the eminent French painters of the earlier part of the century whose work is exciting a good deal of revived attention just now. It is accompanied by some reproductions of figure-studies by Ingres. The same number includes an article by M. Eugène Müntz, "Apropos de Botticelli," and one of more special interest to architects, on the ruins of Timgad or Timegad, by M. R. Cagnat, under the title "La Resurrection d'une Ville Antique." M. Cagnat's description, accompanied by some photographs, gives a good idea of the interest of this series of ruins of the time of the later Roman Empire. It is a first article only, and is to be continued. The same number includes an illustrated article on the work of Wenczel Jamnitzer, a little known Nuremberg silversmith of the sixteenth century, and one on the London exhibitions of the year, by M. Henri Frantz, the same writer who takes up the cause of Rodin's "Balzac" in the *Magazine of Art*, and whose criticism does not seem to be taken from a very central standpoint.

In the *Art Journal* Mr. F. Miller writes on the fascinating art of enamelling, and especially on the enamel work of Mr. Alexander Fisher. There is also an interesting and practical article on the working of shell cameos, by Miss Beatrice Thompson.

The *Magazine of Art* has an article of special interest on "Curious Masks among Greeks and Barbarians," with illustrations, and one on reminiscences of Samuel Prout by Mr. Collingwood, who repeats here an interesting anecdote which we remember hearing from him many years ago—how Prout was working before the porch of Chartres Cathedral, and wished he could see more of the sculpture in shadow in the upper part, when the sunlight reflected from a puddle sent a ray of light right up among the sculpture. Prout remarked he would never again be afraid of putting a light where he wanted it. M. Frantz contributes a short article on *the* statue of Balzac, which is beside the mark. It is quite true that Rodin's rough sketch of a statue showed a noteworthy and original conception; the question is whether any artist had a right to send such a mere crudity to an important exhibition, or expect a learned body to accept it as the statue they had commissioned.

The *Studio* (August 15) contains an illustrated paper on "Celtic Sculpture" by Mr. Romilly Allen, and one by Mr. Frederick Wedmore on the very interesting subject of "Expressive Line" in art, with some very suggestive illustrations, especially two studies of figure attitudes in ink line by M. Forain.



[See preceding page.

The *Artist* has an article on "The Bedroom and its Furniture," with sketches of some very well designed simple furniture, praiseworthy both from an artistic and constructional point of view. Among the other contents are papers on "The Dyeing of Fabrics," and "The Printing of Wall-Papers."

The *Antiquary* contains, under the heading "Ramblings of an Antiquary," an account, with some small illustrations, of two ancient wall paintings, at the churches of Irchester and Mears-Ashby respectively, in Northamptonshire.

In *Scribner's Magazine* "The Field of Art" is occupied by Professor Goodyear with an essay on his gigantic mare's-nest in discovering geometric and optical intentions in every settlement or every irregularity of setting out in an ancient building. The last example he has got hold of is that the eastern bay of the nave of Wells is a few inches narrower than the others, and "there is no doubt that the last pair narrow to 9·12 by intention." If Professor Goodyear had realised that English Cathedrals were almost invariably built from east to west, he would have realised that this is the *first* bay in order of building instead of the last; while a glance at the plan might have suggested that its width was controlled by the width of the west aisle of the transept. There are frequent instances of the arch next the crossing being different from the more western ones, for the simple reason that the crossing was almost invariably built before the nave, but the first bay of the latter was built with it for abutment, and, where the transept had a western aisle, because it flanked that aisle; then there was frequently a pause in the building, and the remainder of the nave would be carried out by a different set of men; there is the simple practical explanation of what Professor Goodyear makes a mystery of.

In the *Century* the "Old English Masters" article and illustrations are devoted to Hoppner, whom Mr. Van Dyke characterises as a follower and imitator of Reynolds, but with a spirit and a view of his own. An engraving of his excellent portrait of Pitt is given as one of the examples of his art. A note on Gilbert Stuart, an American portrait painter of the early part of the century, educated in England, is of interest, and his portrait of "Mrs. John Travis" a very dignified one.

In the *Nineteenth Century* a paper on the "Art-Treasures of America," by Mr. William Sharp, gives some idea of the immense amount of picture-collecting which has been going on in America in recent years. An American millionaire, it appears, need not keep either race-horses or a yacht unless he cares for racing or yachting, but pictures he must have, whether he cares for them or not, or he is out of the pale of social salvation. The result is that, we are told, there is some justification for the reply of a boy to an examiner, that Barbizon was "somewhere between New York and Boston." Jules Dupré, Cazin, Benjamin-Constant, and Carolus Duran, we are told, "are better known on the banks of the Hudson than on the banks of the Thames"; which may easily be the case; the English public are almost culpably ignorant of contemporary French art. They may retort that the French are equally ignorant of contemporary English art; but the Americans seem to be pretty well acquainted with both.

Temple Bar contains a rather rambling article by Mr. J. C. Paget on St. Front, or, as he calls it, St. Frond at Périgueux, chiefly of interest as indicating that it is now thought worth while to introduce articles on architectural subjects into popular magazines. Unfortunately the author, while he quotes Viollet-le-Duc as showing the constructive reason for pointing the round arch, is weak enough to add that "this theory in no way contradicts the popular explanation that the pointed arch arose from the crossing of the two round arches," thereby doing his best to perpetuate a popular fallacy. The leading idea of the article, that the Aquitanian architecture is the fountain head of Gothic architecture, is quite untenable. We should imagine, though no reference is made to it, that the author has been reading M. Corroyer's book—a very misleading one.

In the *Pall Mall Magazine* an article is devoted to Dalkeith Palace—more to the contents than the building; and "A Day of My Life at Cambridge" serves as a tag whereon to hang a number of charming sketches by Mr. Railton.

In the *Gentleman's Magazine* Mr. Harwood Brierley gives an account of the Great White Horse of Yorkshire, near Hambleton, less known or talked of than its compeer of Berkshire, perhaps because no Tom Hughes has made a novel out of it; *caret vate sacro*.

In the *Quarry* Mr. Elsden's papers on "Applied Geology" continue to be of interest; but papers like that on "The Bridge and Cureton Company's Quarries" look very like "doing business" with the articles.

COMPETITIONS.

SCHOOL BUILDINGS, GLOUCESTER.—A meeting of the members of the Gloucester School Board was held at the Guildhall on the 29th ult., to decide upon plans for a new school to be erected on the eastern boundaries of the city, and appoint an architect to carry them out. Some months ago the Board invited architects having offices in the city to send in competitive plans, for which prizes were offered. Nine plans were sent in, and were submitted to Messrs. Martin, of Birmingham, who awarded a plan submitted by Mr. A. J. Dunn the first prize, and the Board, at a subsequent meeting, confirmed the award. Dr. Hadwen moved that Mr. Dunn's plans be accepted for the construction of the schools, and that he be appointed as architect to carry them out. A long and animated discussion took place on the motion, which was opposed by the chairman, the vice-chairman, and others, who argued that Mr. Dunn's residence was in Birmingham, and his practice was there, and that, though he had an office at his father's house in Gloucester with a brass plate at the side of the door, he was not a *bona fide* resident. Moreover, the carrying out of his plans would, it was estimated, involve an expenditure of about 19,983*l*., whereas if the plans of Mr. Medland—who had been the Board's architect for twenty years, and who had been placed second, and which, in the opinion of some members of the Board, were superior to those which the referee had placed first—were carried out, the cost would be considerably less. On the other hand, it was argued that no evidence had been given that the cost of carrying out Mr. Dunn's plans would be so great as had been stated; that his title was perfectly *bona fide*, as he had an office in Gloucester; and that, having awarded his plans first prize, the Board were almost compelled to accept them for the new schools. Eventually Dr. Hadwen's proposition was carried by a majority of one.—*Bristol Times*.

Books.

The Princely Chandos: a Memoir of James Brydges, First Duke of Chandos. By J. ROBERT ROBINSON. London: Sampson Low, Marston, & Co., 1898.

THIS very badly-written book is stated to be a new and cheaper edition of a work already published. The greater portion of the contents belongs to general history; its only interest for architectural readers is that it gives some account of that mansion, under the name of "Canons," the mushroom erection of a mushroom Duke, the speedy disappearance of which was so shrewdly prophesied by Pope. The elevation of the south front is given, showing a ground and first story of rusticated masonry, with an order of six Ionic columns on the centre portion, with cornice and attic and statues over. The principal entrance was from the high road about half a mile beyond Edgware, and it is stated that the drive was so laid out as to face the building anglewise at the outset, thus giving it greater size in the distant view. The walls were 12 ft. thick in the foundations, reduced to 9 ft. above the ground level. The total disappearance of such a structure almost immediately after the first owner's death is a curious and perhaps almost unexampled incident in the history of great mansions. The Duke had encumbered the estate in order to keep up his magnificence during his life, and everything had to be sold to pay off the liabilities. The mansion was simply sold off in lots, as building material. Some notes are given as to the fate of some portions of the house. The marble staircase and columns were erected in the

house then Lord Chesterfield's in Mayfair, where they still are. A good many details in respect to other objects are given, but with the intimation that the authority for them is doubtful.

The Young Estate Manager's Guide. By RICHARD HENDERSON, Member of the Surveyors' Institution, &c., with introduction by R. PATRICK WRIGHT, F.R.S.E., Professor of Agriculture, Glasgow and West of Scotland Technical College. Edinburgh and London: William Blackwood & Sons, 1898.

PROFESSOR WRIGHT, in his well-written introduction to this little volume, plays the part of admiring friend, and expresses so high an opinion of Mr. Henderson's qualifications for the task of Mentor to the young estate-manager, that the ordinary critic is almost afraid to venture on a word of dispraise. "The special value of this book," he tells us "lies in the fact that it is a record of the results of prolonged experience, of observation, and of reflection by a man whose education, and whose familiarity both with the science and the practice of agriculture have given him exceptional qualifications, and who has had ample opportunities of submitting his conclusions to the test of actual trial." After all this one is tempted to ask if Mr. Henderson, during his "prolonged experience," ever heard of a damp-proof course, and of its sanitary importance. Certain it is that we can find no mention of such a thing, either in the index or text, and that the illustration on page 43 does not show one. The illustrations as a whole are indeed the worst part of the book, perhaps the very worst being the drawing of a kingpost roof-truss, in which the struts spring from below the shoulders of the kingpost, and the diameter of the ridge-roll is equal to the depth of the tie-beam.

The scope of the book is wide, including six chapters on the various building trades, three on the design, specification, and sanitation of the "farm-steading," and other chapters on land-drainage, forestry, fences, roads, water-supply, and accounting. There is also a good index. The several subjects are discussed at such length as the limits of the book will allow, and Mr. Henderson has undoubtedly condensed a great deal of valuable information into a small space. The chapters on general estate work are the best, and will be of great service not to the young student only, but also to the student of larger growth. The chapters on building are the weakest; a man who knew his subject would scarcely make the contradictory statements about "fireclay bricks," which appear on pages 16 and 18; on page 16 we have, "Besides, if exposed, it is questionable if they would stand weather well," and on page 18, "they are likely, one would think, to be able to hold out well against the destructive powers of a changeable climate." The statements on page 89, about lead-poisoning, are scarcely correct; even pure water will, in the presence of air, dissolve lead, although, of course, not to the extent that (say) moorland-water will. We are glad to find that Mr. Henderson is alive to the prevalence of tuberculosis among dairy cows; and attributes it to the insanitary conditions in which they live; his remarks on the sanitation and veutilation of cow-houses are worth serious consideration by farmers and estate agents.

Many of the building terms used in the book sound strange to southern ears, but will doubtless be intelligible to the young Scot, for whom chiefly the book appears to have been written. We have pointed out a few blemishes in Mr. Henderson's work, but in the main, to use the stereotyped formula, "it fills a long-felt gap," and will be a boon to the estate manager, young and old.

Journal of the Sanitary Institute, Vol. XIX., Part II. London, 1898.

THE journals of learned societies are usually interesting and up to date, and this under notice is no exception to the rule. The three papers it contains will all well repay perusal. The first, by Professor J. Lane Notter, M.A., M.D., deals with the "Purification of water for barracks, prisons, and other institutions." The filtration of water on a small scale is first considered, but the matter scarcely goes beyond the researches of Drs. Sims Woodhead and Cartwright Wood, published in the *British Medical Journal* at the beginning of this year. The latter part of the paper treats of the sterilisation of water, and contains a record of experiments made by Professor Notter on the sterilisation of water by means of a small proportion of a solution of bromine, the water being afterwards decolourised by a solution of hyposulphite of sodium. In the discussion which followed the reading of the paper the possibility of danger resulting from the drinking of water containing bromine was mentioned, but the Professor withheld his opinion on the point. Dr. Child's paper on "Water-borne typhoid fever" is chiefly valuable for his insistence on the fact that typhoid fever may be not only water-borne but air-borne. The third paper is on "The desirability of making watershed areas and sanitary districts coterminus," and the writer, Mr. R. E. Middleton, M.Inst.C.E., presents a strong case in favour of the suggested reform. When we read that "the watershed of the Severn affects twelve counties and some 1,316 Councils," and that "the Cambridgeshire Ouse touches eight counties and some 1,200 Councils," we can form some idea of the conflicting interests which militate against the purification of the rivers in question. Mr. Middleton's plea is for a central authority for each watershed area, whose duties "should consist in the conservation of the river, its banks, and navigation, if any; in the maintenance of its purity, including that of its tributaries; in the encouragement of combination and efficiency in sewage disposal; and in the prevention of floods." An important and useful feature of the *Journal* is a list of articles relating to public health, which have appeared in recent British and foreign journals and transactions, the *Builder* not being overlooked. We can recommend the *Journal* of the Sanitary Institute to all persons interested in sanitation.

Arnold's Scale Drawing Sheets; with Explanatory Notes. By A. W. F. LANGHAM and A. WHILLIER. London: Edward Arnold, 1898.

THIS is a set of twenty diagram sheets, large enough to be visible to a whole class when hung up, and intended to form object lessons for beginners in learning to draw to scale; commencing with the formation of the scales themselves, and the use of set-squares, and proceeding to the geometrical drawing of simple objects according to scale. The diagrams, of which there are twenty, are numbered, and accompanied by an explanatory pamphlet with corresponding numbers; the explanations being written by Mr. Langham, Inspector of drawing under the London School Board, and Mr. Whillier, assistant organiser in manual training and woodwork under the same Board. The diagrams are very clear and comprehensible, and are likely to be of use to instructors in primary drawing. We may remark, however, that in introducing isometrical drawing, it should have been definitely explained what is the difference between this and perspective drawing, and that isometrical drawing does not show things as they can ever really appear. Without some such caution, beginners will be apt to think that in drawing the isometrical view of a circular grindstone on sheet 20, they have made a perspective representation of it, whereas they have only really drawn two perspective circles of the same size at a little distance from each other; the difference in appearance is very slight, though the difference in principle is so great.

Wireless Telegraphy Popularly Explained. By RICHARD KERR, F.G.S. London: Seeley & Co., Limited. 1898.

THIS interesting little book describes in a popular manner what has been accomplished up to the present time in telegraphy through space without connecting wires. Mr. Kerr's historical survey is unbiassed, and he has succeeded in giving due praise to some of the pioneers in this new system of telegraphy. The descriptions of the apparatus, although untechnical, are accurate, and can be understood by the general reader. As this system will in the near future be used for many important practical purposes, we welcome this book as a good attempt to explain to the general public the principles underlying this recent application of electricity.

Electric Wiring and Fitting Details Book. By W. PERREN MAYCOCK, M.I.E.E. London: Whitaker & Co.

THIS is simply a large book of tear-out leaves ruled for directions for electric wiring, with vertical columns headed "Floor," "Item," "Description of Fittings with Catalogue Numbers," "Lamps," "C.P." "Circuit," and "Remarks." At the foot of each ruled page is a space for "Wiring Diagram."

Illustrated List of Exhibits to which medals have been awarded at the Exhibitions in connexion with Congresses of the Sanitary Institute. London: Offices of the Sanitary Institute. 1898.

THIS book forms a kind of illustrated *catalogue raisonnée* of some three hundred appliances or inventions which the Sanitary Institute have thought worth the award of a medal. It is not be supposed that it necessarily contains the pick of recent patents and inventions, but it contains a good many which are of practical value, and it is stated in the preface that the judges laid it down as a guiding principle that awards should be made in the interests of the public; and that, as a rule, no award was given to any exhibit unless some of the judges knew by experience that it was of value, or unless it had been subjected to special practical tests during the continuance of the Exhibition. It is therefore a book which architects may find useful for reference.

TRADE CATALOGUES.

MESSRS. KENNEDY & BOWDEN, "artists in stained glass and sanitary decoration," (Oxford and Reading) send us two illustrated catalogues of their work in stained glass, brass church furniture, domestic ornamental glazing, &c.——"The Sanitary Auger Syndicate" (London) send us a circular and illustration of their "Patent Flexible Auger," the object of which is to clear out traps and drains. The following is part of the description of the implement:—"It enters from the manhole, inspection, or 'S' trap, and is pushed down, making all the bends and turns, going 10 ft., 12 ft. or more. When the obstruction (of whatever nature) is reached, if it is of a metallic nature, such as a tin can, broken China, brush, stick, &c., it first passes in somewhat like a closed umbrella, and then by withdrawing the auger the cone on the end opens and brings back the obstruction at once. If the obstruction is lint, paper, or cloth, the corkscrew at the end of the auger bores into it and is brought back." The list of articles which it has already brought out of traps and drains is curious and formidable.——Messrs. College & Bridgen (Wolverhampton) send us an illustrated leaflet of their two forms of wrought steel sink, the "Eclipse" and the "Special," enamelled white inside; they have the advantages of lightness and economy and take up little space, and would be very useful for the smaller class of houses. ——Messrs. J. Duckett & Son (Burnley) send us an illustrated sheet of their self-cleansing channel gulley, intercepting trap, and automatic slop-water closet, with a three-gallon automatic tipper; this last we think we have noticed before, but there is some interest attaching to it now from the fact, as certified in an extract from a Sheffield paper, that the Corporation of Lincoln condemned these closets recently in some houses erected by a local builder, inserting their own pattern and and charging the builder for the work. He refused to pay, and appealed to the Local Government Board, who ratified the slop closet, and not only exonerated the builder from paying, but obliged the Lincoln Corporation to pay their (the Board's) costs. This was certainly a triumph both for the builder and for the manufacturers of the closets in question, and is a decision which should be put on record; we did not receive any report of the case at the time it occurred. Of course, it must be remembered that the efficiency of such a slop closet depends entirely on the house furnishing "slops" enough for a frequent charge of the tipper, and we believe we pointed out before that the discharge of the tipper, placed just above the trap, could not have the same scouring force as a discharge from an over-head supply cistern. That is the weak point, though the closet is undoubtedly an ingenious and for some classes of property a useful one.

SLAUGHTER HOUSES, BLYTH, NORTHUMBERLAND.—A Local Government Board inquiry was held in the Mechanics' Hall, Blyth, on Thursday, the 1st inst., relative to application from the South Blyth Urban Council for sanction to borrow 1,250*l.* for the building of new slaughter houses at Blyth.

Correspondence.

To the Editor of THE BUILDER.

THOMAS DREW, ARCHITECT, 1760 (?).

SIR,—Can any reader of the *Builder* kindly turn up any record of one Thomas Drew, architect, stated by his direct lineal descendant to have lived in Sloane-street, and to have been engaged in works at historical Sion House? Brewer, in the fifth volume of "Brayley's Topographical History," 1816, in his notice of Sion or Syon House, gives the date of its last important rebuilding as 1790, and "*supposed to be*" under Inigo Jones.* A subsequent allusion is made to further additions or beautification under Adam. Is this to be taken (as in Ireland, where there is much delicate work in the manner of Adam—of the Wedgwood era, which the brothers Adam never saw or heard of) as a generic term? Is there any remembrance of an architect named Drew, of Sloane-street, who a hundred years ago may have designed works at Sion House in the prevailing Wedgwood mode, which many contemporary architects affected as well as the Adams?

THOMAS DREW, F.R.I.B.A.

Dublin, September 6, 1898.

JAMES II.'S STATUE, WHITEHALL.

SIR,—In your article "On Architectural Inscriptions and Insignia" of September 3, the lettering on the pedestal is described as being a recent addition. In "A New View of London," 1708 (by Hatton), the inscription is given thus: "Jacobus Secundus Dei Gratia Angliæ, Scotiæ, Franciæ, and Hiberniæ Rex, Fidei Defensor, MDCLXXXVI.," and so in effect it has stood to our own day. Hatton has "&" for "et," and omits "Anno" before the date. For "Jacobus" was cut "Jacobi" (possibly since his time, for he says the inscription is "almost worn out"), a mistake rectified since 1844; yet "Gratiæ" for "Gratia" remained when I copied the inscription two years ago.

If the statue was popularly known as Julius Cæsar's, the belief, perhaps, formed an unconscious tribute to the beauty of its classical design.

In "London, Past and Present" it is stated (wrongly) that the statue is of lead. D. M.

APPOINTMENT OF ARCHITECT, SALFORD WORKHOUSE.

SIR,—The letter from "Vitruvius" on the above matter in your issue of August 27, prompts me to say that I was amongst those who declined to accept the terms offered by the Guardians.

I think Messrs. Worthington are wrong in stating that three architects gave way, as according to my recollection it was four out of the seven who agreed to the terms proposed, and three (Messrs. Worthington, myself, and another gentleman who will no doubt speak for himself) who withdrew from the competition when the Guardians declined to alter the terms of remuneration.

JAMES B. BROADBENT.

The Student's Column.

SOUND, LIGHT, AND HEAT.—XI.

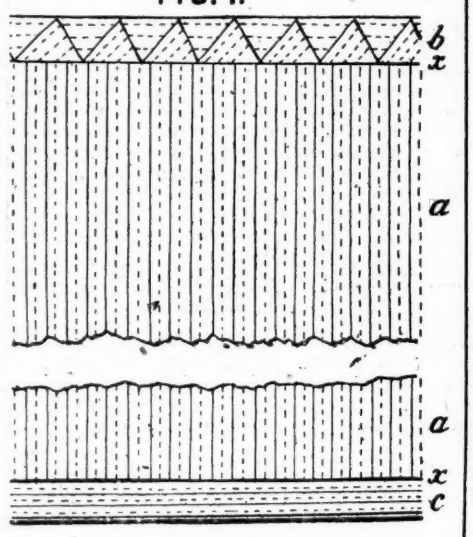
SOUND: WALL LININGS.

WE have already given some idea of the class of materials a sound-proof partition-wall should be made of. In further considering the practical applications of the science of acoustics it will be well to pursue the subject of the actual construction of the linings of sound-proof walls in general, confining our attention, at first, to linings of wood. The ideal lining, perhaps, is a substance without fibre in it, seeing that fibres act as "conducting wires"; and if a fibrous material is employed the fibres should be broken off and rendered as discontinuous as may be.

We cannot get wood without fibre, or at least a series of general directions in cells which act as pseudo-fibres, disturbing the homogeneousness of the material and therefore promoting the propagation of sound within it. By careful selection we may be able to find certain varieties of wood in which the fibres are to some extent discontinuous, or where the size of the conducting cells is so variable as to act as an impedient to the propagation of sound. Again, many varieties of wood may be found in which the same phenomena could be brought about by extreme irregularity of growth of the tree and the accompanying development of knots. But, unfortunately, it so happens with the commoner kinds of timber employed in Great Britain that the best to conform with the conditions we have laid down is either extremely soft or very hard. Under these circumstances, it will be desirable, from a practical standpoint, to see whether art cannot assist Nature to bring about the desired result. In other words, after having selected a fairly suitable wood, let us see whether we cannot assist it in its capacity of a sound-proof material by constructing the lining made of it in a special fashion. We give some examples in illustration of the modes of construction suggested:—

Fig. 1.—In this we have the main part of the wall lined with narrow strips of wood, *a*, running up and down perpendicularly. The direction of the grain of the wood, or at least the general trend of it, ignoring knots, is shown by the dotted lines — and this method is adopted in the other diagrams in this article also. The perpendicular strips are cut off near

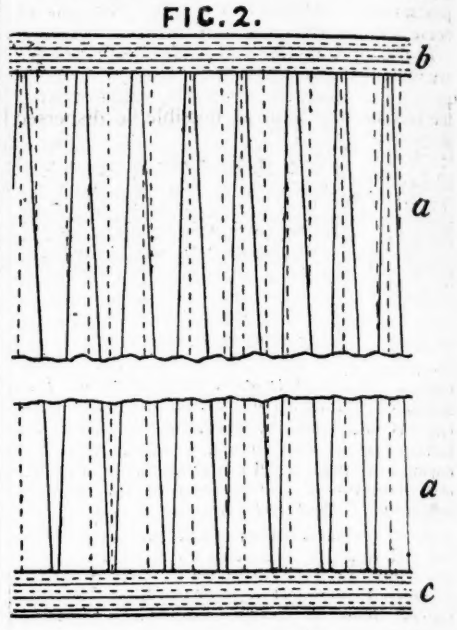
FIG. 1.



the ceiling by a horizontal band of parquetry, *b*, which may be plain as shown or dog-toothed or ornamented in any way, provided the principle is observed. *c* is a horizontal cut-off acting as the skirting, which consists of strips of wood. It will be understood that *b* and *c* are not in any way fixed to the face of *a*, being merely joined to *a* along the line *x*. If *b* and *c* project beyond the surface of *a* it will only be because the wood of which they are made is thicker. There is not the slightest objection from an acoustic standpoint, however, to the surfaces of both *b* and *c* being made flush with *a*, and then any desired mouldings or other ornamentations being fixed to them. It is a *sine quâ non*, however, that the whole, *a*, *b*, and *c* shall be fixed in the wall, as, if any spaces are left behind, they would act as a species of imperfect sounding-board. The student who has carefully followed the preceding articles will readily perceive the cause of this. This plan of construction is by no means the best, as will be immediately seen, but it is preferable to ordinary methods, and is here described as being cheaper than some of the designs which follow. The principle (see our observations on the velocity of sound) may thus be described. The sound on striking *a* runs up the longitudinal fibres to *b*, or down to *c*. At the point *x*, these fibres being cut off, the propagation is impeded and the sound is distributed. In the case of *b* it is partially collected and re-directed obliquely, but is again seriously interfered with by those triangular pieces of parqueting next the ceiling which, as will be seen, have a horizontal grain. The direction of the sound is there turned round on itself, so to speak, and is largely prevented from penetrating (by means of the wall, at any rate) to the room above. If there be no room above, then the whole of *b* may be dispensed with. The sound travelling down to *c* is suddenly impeded at the point *x*, and *c* may be constructed as shown or like *b*, the object of our showing it as it is being merely to indicate a possible difference of construction. Of course, *b* "breaks up" the sound better. In regard to the width of the strips in *a*, care must be taken that they are not too narrow, for they would then tend to act as so many vibrating rods and give more work for *b* and *c* to do. (See *ante* p. 194 as to phenomena accompanying the vibration of rods.) Three inches would be a convenient width for the strips lining a wall say 14 ft. in height. With increase of height there should be an increase in the width of the strips up to, say, 7 in.—as in the case of a large hall. The lining of the latter, however, should, preferably, be constructed on the plan suggested in figs. 3 and 4.

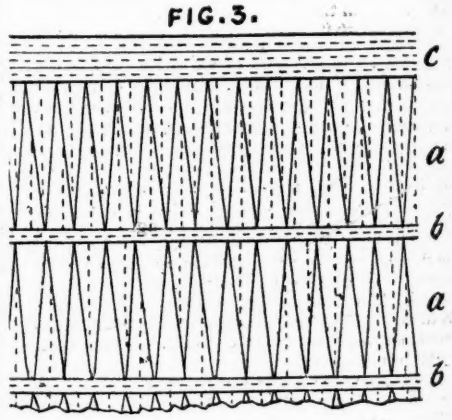
Fig. 2.—The weakest part of the design fig. 1, as the wainscoting of a large room, is in

FIG. 2.



the part *a*; economy in price, as already stated, dictated that method. In the design fig. 2 the method of the whole is practically the same, with the exception of the part *a*. The construction of *b* and *c* in fig. 2 is like that of *c* in fig. 1, and the same observations apply. The student is aware that the object of the narrow strips in fig. 1 is to break up the sound tending to run along the horizontal fibres, or "rings,"

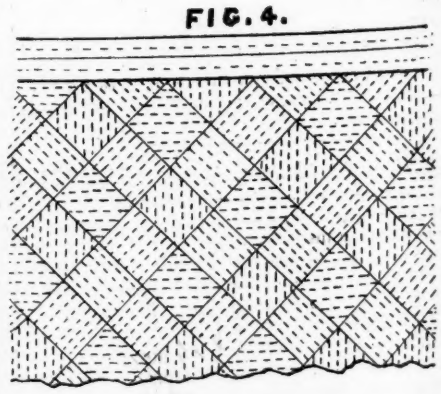
FIG. 3.



in the wood. The same object is effected by *a* in fig. 2; but, in addition, a large number of the perpendicular fibres are intersected by reason of the narrow strips being alternately tapered off, in the manner shown in the diagram.

Fig. 3.—A modification of the last method, in which the perpendicular strips, *a*, are much shorter and run in tiers, divided by one or

FIG. 4.



more strips of wood, *b*, arranged with the fibres running horizontally. This is a more expensive form of lining or wainscoting, and is more effective as a sound-proof construction,

* Is it possible that any writer can have said anything so absurd? Inigo Jones died in 1652.—ED.

the propagation of the sound being interfered with in so many directions. It would be still more effective were the alternate perpendicular strips cut with the grain horizontal.

Fig. 4.—In this, which is a species of parquet wainscoting, the wood is cut in small squares, care being taken in fitting them together that the grain of adjacent squares shall not run in the same direction. This plan admits, also, of pentagonal, hexagonal, octagonal, &c., pieces being used instead of squares.

The student will perceive that these designs are susceptible of much modification; once the principle is grasped—that the sound striking the wall must as soon as possible be dispersed and not allowed to run far in any direction—the design becomes merely one of economic interest, within certain limits. Should it be desired, with such constructions as depicted in figs 1-3, to prevent the sound penetrating perpendicular corners of walls, the "cut-offs" *b* and *c* (figs. 1 and 2) can also be placed in those positions.

OBITUARY.

MR. CHARLES PARSONS, OF BURNLEY.—We have to record the death of Mr. Charles Parsons, architect and surveyor, Burnley, in his thirty-eighth year. He was elected to the Burnley Town Council in 1890, and latterly had been a most active and respected member of the Corporation. He was elected chairman of the Gas Committee on the death of Alderman Collinge last year.

GENERAL BUILDING NEWS.

NEW UNIONIST CLUB, ABERDEEN.—The new Unionist Clubhouse and Hall, Aberdeen, are almost completed, and will be opened by the Marquis of Lorne early next month. The building has frontages to Rosemount-viaduct, Union-terrace, Shene-terrace, and North Silver-street, and the front line is curved. The structure is a fine Classic building in granite and is three stories high. There are three shops on the ground floor, the floors above being devoted to uses of the club. The central portion of the elevation rises to a height of 64 ft. above the ground level. The entrance doors to the club-rooms have arched heads, and are flanked by pilasters with obelisks above. The hall is 75 ft. long and 42 ft. wide, and from the floor to the coved ceiling there is a height of 26 ft. There is a small gallery in the hall. There are also kitchen, buffet, pantry, and lift to refreshment-room on the second floor. The accommodation likewise includes smoking-room, 23 ft. by 29 ft.; reading-room, refreshment-room, lavatories, committee-room, recreation-room; caretaker's-parlour, kitchen, and scullery; billiard-room, 55 ft. by 42 ft.; second ditto, 32 ft. by 42 ft.; and bedroom and pantries. The heating will be done by steam-pipes, and the lighting by electricity. The total cost, exclusive of furnishings, is 10,000*l.* The architect is Mr. A. H. L. McKinnon, Aberdeen, and the contractors are:—Mason-work, E. Gould; carpentry, Jno. Henderson; slating, G. Farquhar; painting, Mason & Son; iron-work, G. Bisset; plastering, J. Stephen & Son; plumber's work, electric lighting, and heating, Walter Simpson—all of Aberdeen.

CHURCH EXTENSION, CLEETHORPES.—On the 31st ult. a commemoration stone was laid in St. Aidan's Church Institute and Sunday School, Cleethorpes, by the Mayor of Grimsby. The estimated cost of the building is 1,500*l.* Mr. C. Hodgson Fowler, F.S.A., of Durham, is the architect.

WESLEYAN HOMES, FILLONGLEY, NEAR BIRMINGHAM.—The foundation stones of some cottage homes which are being erected at Fillongley were laid the other day. The houses are intended for the occupation of aged Wesleyan preachers, and are estimated to cost 1,253*l.* Mr. J. T. Yates is the architect.

DRINKING FOUNTAIN, STOKE BISHOP, BRISTOL.—A fountain presented as a Jubilee gift to Stoke Bishop has recently been put into operation by the Duchess of Beaufort. The structure occupies a three-cornered site fronting the main road in the village. It is of Aberdeen granite, and is placed in the centre of an octagonal shelter, with an approach at four sides, and is raised on three Pennant stone steps. The roof of the shelter is covered with Broseley tiles, surmounted by a lead apex and finial, and by an ornamental structure of oak posts and balusters, with arched panelled head and frieze, having an inscription in raised letters. The base consists of red Mansfield stone, panelled, and dog troughs of Pennant stone are placed at each of the four sides. The work has been carried out by Messrs. Cowlin & Son. The architect was Mr. C. A. Rowley, of Bristol.

BUILDING ACTIVITY IN DEWSBURY.—At the present time a considerable amount of building work is being carried out in Dewsbury. Amongst other things contractors are engaged in the erection of a large wing at the Technical School, an addition of a score of rooms or more. The architect is Mr. John Lane Fox, of Dewsbury. He is also engaged in the construction of a wing at the east end of the Masonic Temple (St. John's Lodge), in Halifax-road. It will provide a new and commodious billiard-room, with supper-room over, besides other accommodation. Mr. Fox has likewise in hand new banking premises near the Market-place for the London and Yorkshire Bank, Limited. The cellaring is practically completed, and the granite walls of the first floor elevation will soon appear. Messrs. John Kirk & Sons, architects, Dewsbury, are preparing plans for an addition to the premises of the West Riding Union Bank. They will provide for an additional strong room and offices. The addition will be in the same style of architecture as the main building. The same firm is erecting more villas on the Carrett estate. Contractors have commenced operations at the north end of the intended arcade from the Market-place. Near the north end of the arcade three shops having a frontage to Corporation-street are about to be erected from the designs of Messrs. C. H. Marriott & Son, architects. For some months past alterations and improvements to the Central Stores of the Co-operative Society have been in operation, from designs by Messrs. Holtom & Fox, architects, of Dewsbury, and it is expected that nearly half a year will elapse ere they are completed. Two shops and residences in North-gate are being razed to the ground, and Messrs. Holtom & Fox will erect shops and houses for business purposes thereon, after setting back to the new building line fixed by the Corporation. These are the chief improvements now being effected in Dewsbury, but it may be mentioned that Messrs. D. & W. Thornton, architects, Dewsbury, are completing the erection of a large warehouse in Crackenedge-lane, near the intended new market-square. Three shops at the south end of Union-street are almost out of the builders' hands.

HOTEL, CULTER, ABERDEEN.—The hotel which is now being erected at Culter, on the main road from Aberdeen to Banchory, will form one of the largest buildings in the place. The front elevation is to be built of Kemnay granite, and will have a verandah with a balcony in the centre between the projecting cross wings. The ground floor will contain a coffee-room, smoking-room, sitting-room, still-room, with bar at back entering off the side road, and kitchen and other accommodation. The first and second floors will have three sitting-rooms and fifteen bed-rooms, with bath-room and lavatory accommodation on each floor. The whole of the internal furnishings will be of varnished pitch pine. The estimated cost is 3,000*l.* The following are the various contractors:—F. Morrison, Culter, mason; J. Forbes, Aberdeen, carpenter; J. Campbell, Aberdeen, plumber; Roger & Baxter, Aberdeen, plasterers; G. Farquhar, Aberdeen, slater; W. Philip, Aberdeen, painter and glazier; Shirras, Laing, & Co., Aberdeen, bellhangers. The architect is Mr. John Rust, of Aberdeen.

HOTEL, SEA-ROAD, BEXHILL, SUSSEX.—The "Sussex Hotel," about to be erected at the corner of Sea-road and Jameson-road, Bexhill, in addition to smoking-rooms and billiard-room, will have large coffee and reading rooms besides the usual sitting and drawing rooms. There will be thirty-one bedrooms. The architect is Mr. A. C. D. Hicks, of Bexhill.

ALTERATIONS AT THE GUILDHALL, NEWCASTLE-ON-TYNE.—The interior of the old Guildhall at Newcastle has been completely transformed by the alterations recently effected within it, and the "new Exchange" was opened for the transaction of business on the 30th ult. In the work of alteration the ten heavy stone piers carrying the arches which supported the north wall and floor of the Guildhall have been removed, the superstructure now being carried on steel girders, resting on four steel stanchions. The work of demolishing the old interior and substituting the new was one in which the greatest care was necessary, the more so as the Exchange business had all the time to be carried on on the floor above. Under the new scheme the Exchange proper covers an area of 3,800 square feet, with a cubical space of 77,000 ft., and it has entrances, on the north from the Sandhill, and on the south from the Quayside. On the left of the Sandhill entrance are the porter's, reading, and manager's rooms, with retiring accommodation. Adjoining the entrance from the Quayside are the writing-room, accommodation for the Chamber of Commerce, telegraph and telephone room, and smoking-room. These apartments, all well lighted, are separated from the Exchange proper by glazed screens. The reading room occupies the eastern end of the building. In the Exchange, increased height has been effected by lowering the old floor 2 ft. 4 in., giving a height to the Exchange of 20 ft. 6 in. The windows have been increased in size, and now have a lighting area of 648 square feet, as against 370 square feet formerly. The floors are covered with wood-block flooring, supplied and fixed by Messrs. Greary & Walker, of London. The heating is by hot water on the low-pressure system the ventilation, is effected by the introduction of fresh air on the Tobins tube principle, the foul air being extracted by a large Blackman's fan, worked by an electric motor, and supplied by Messrs. Henry Walker & Son of Newcastle. The decorative fibrous plaster work has been modelled and carried out by Mr. W. R. Dodds, of Jarrow, the general contractor being Mr. Thomas Lumsden, of Jarrow. The supporting steel stanchions are encased in fibrous plaster columns, and finished in Ionic caps below the girders, which are also encased in plaster, moulded, the cross beams resting at the walls on pilasters treated in a similar way to the columns. Messrs. Armstrong & Knowles, of 38, Grainger-street West, Newcastle, are the architects.

BUSINESS PREMISES, COMMERCIAL-ROAD, PORTSMOUTH.—Large offices, erected for Messrs. King & King, auctioneers, of Portsea, have recently been completed in Commercial-road. The front is built of Portland stone,; there is a mansard roof, covered with patent copper tiles of a Renaissance design. The doorway, which is on the right hand side, gives entrance to a wide corridor, paved with Terrazo mosaic. On the right hand are blue cloth-covered panels, and on the left are the public offices, with mahogany fittings, and paved with Terrazo in front and wood blocks behind the counter. Opening from the offices is the strong room, which is 8 ft. by 6 ft. A private office is close by. The corridor leads into the property sale-room, which is 42 ft. long by 28 ft. wide. It is lighted by means of a large rectangular lantern, and has a cove ceiling with moulded ribs, and a dado of lincrusta walton. The dado is teak-coloured and a rail of polished teak separates it from the wall-paper. The furniture sale-room and store have a separate entrance in Swan-street. The sale-room is about 60 ft. long by 30 ft. broad, and, like the rest of the ground floor, has wood-block flooring. Above is the furniture store, communicating with the sale-room by means of a hatchway and a staircase. Goods can be taken in and out both through the hatchway and, by means of tackle, from the yard at the side. A clerks' office separates the furniture sale-room from the property sale-room. The private offices of the principals of the firm are upstairs, overlooking Commercial-road. All the rooms are fitted with the electric light. The caretaker's apartments are on the top floor, and comprise a suite of two bedrooms, a sitting-room. kitchen, pantry, &c. The builders are Messrs. W. R. Light & Son, of 445, Commercial-road, Portsmouth, and the architect is Mr. A. H. Bone, of Cambridge Junction, Portsmouth.

SCHOOLS, TROON, N.B.—A large school is in course of erection in Brassie-street, Troon. The building, which is to be of red sandstone from Ballochmyle Quarry, Mauchline, will accommodate 550 pupils. The following are the contractors for the work:—Watson & Adams, Troon, digger, mason, and brick-work; John Templeton & Co., Troon, carpenter and joiner work; David Walker, Troon, plumber and gasfitter work; Thomas Hall & Son, Irvine, slater work; Archibald M'Skimming & Son, Troon, plaster and cement work. The estimates accepted amount to about 5,000*l.* The architect is Mr. R. S. Ingram, of Kilmarnock.

RESTORATION OF ABBOT REGINALD'S GATEWAY, EVESHAM.—Mr. R. A. Briggs, of Norfolk-street, Strand, W.C., the architect appointed by a committee to inquire into the proposed restoration of this gateway, has reported as follows:—"As arranged with the Rev. G. Napier Whittingham, I met your committe last Saturday, the 17th inst., and discussed with them the best way of treating the approach to the above gateway. Informally, before the meeting took place, I had made two suggestions as to its treatment. The first was the very simple one of excavating the ground between the walls of the gateway down to the original level of the floor, which, from the excavation that was made, I found to be about 3 ft. 2 in. In this scheme I proposed to arrange steps down from and up to the existing levels of the churchyard and passage. I, at the same time, pointed out that there was a considerable disadvantage to this arrangement through the natural discomfort it would cause to persons going to and from the church. Your committee have agreed that this scheme would not be acceptable to them. The second suggestion I made was to excavate areas inside the gateway immediately next to the side walls, and to arrange a footway in the centre, with a stone balustrade. The objection to this scheme would be that rubbish would collect in the areas, and I would beg your committee's consideration on this objection. The third scheme that I would suggest, and which would be of a more elaborate and costly nature, would be to make an inclined paved footpath from the point of an existing paved crossing about fifty yards (roughly) north of the gateway, down to the original level of the gateway and up again to the porch of All Saints' Church and the Churchyard walks. This scheme is, in my opinion, the most suitable and the most artistic treatment. As the level of the original floor, as mentioned above, is about 3 ft. 2 in. below the existing level of the footway, and as the path rises about 1 ft. 3 in. from the above-mentioned crossing, there would be only a fall of 1 ft. 11 in. in the proposed new footway—a very easy gradient. Last Saturday through the courtesy of Mr. Hunt, a hole was dug at the corner of the porch of All Saints' Church, and in my opinion the original level of the threshold of this porch is 8 in. below the top of the existing step. I suggest, therefore, that the inclined way proposed to be taken down to the original level of the gateway shall therefore rise again to the level of the porch, and be continued up to the existing churchyard walks at an easy gradient. The occupants of the houses on the east side of the proposed footway would reap con-

siderable advantage if this scheme were carried out, as many of the entrance doorsteps of these houses, which are now below the level of the present pathway—causing, no doubt, great inconvenience through allowing the surface water to enter the houses and passages—would, with the proposed scheme be several inches above the footway. I should propose to put a landing with steps to the entrances of the house situated on the west of the new proposed way, thereby again effecting an improvement to this house. The gateway, which is a very exceptional and interesting example of Norman work is, I am sorry to say, in a bad state of repair, and it is well worthy of careful restoration. Every stone that is intact should be kept and only those stones that are actually decayed should be cut out and replaced. On Saturday I noticed signs that there had originally been arches in the front and back walls. Probably in the original gateway in the Norman period there were small circular-headed arches, which at a later date were taken down, and a much larger arch built. I am of opinion that these arches should be placed in the front and back walls, and I think it would be possible to find out from records what these arches were like. This is a matter for which I should like your committee to also give its consideration. A great improvement to the general appearance of the approach would be to have the colour-wash taken off the walls and timbers of the house on the west of the footway, and to have the timber exposed.

THEATRE, WALHAM GREEN.—A commemoration stone was laid at the Granville Theatre of Varieties, Walham Green, on Thursday, the 1st inst. The chief portions of the structure are completed and the theatre will shortly be opened. The building is so arranged that there is no pit, the audience being supplied with a fine roomy balcony, and over this is a large gallery. The capacity is calculated at nearly 1,500 persons. The edifice is of red brick and terra-cotta, a corner being treated with towers and minarets. Over the entrances will be iron and glass shelters, fitted with painted glass. The entrances and vestibules are decorated with raised plaster, the ceilings and walls being panelled out in Louis XVI. ornamentation. This decoration is carried along the walls of the open corridor at the sides of the stalls, and is finished in blue and gold, with figure paintings in panels. Faience or Doulton ware is used for interior embellishment. Not only are the walls covered with this material, but the proscenium front, auditorium, ceiling, gallery, and balcony fronts are formed of it. Mr. C. Gray Hill is the builder, and Mr. A. Whitehead has executed the teara-cotta decoration. The architect is Mr. Frank Matcham.

HOMES FOR FISHERMEN, GRIMSBY.—On the 1st inst. twenty-nine homes for fishermen were opened in Doughty-road, Grimsby. There are twenty-nine homes in two blocks, fourteen two-story and fifteen one-story houses, the former containing a living-room and kitchen on the ground floor, and on the first floor two bedrooms; while in the latter dwellings there are a living-room and a bedroom on the ground floor. The whole of the internal woodwork is stained and varnished. The floors of the living-rooms and kitchens are laid with red and black Staffordshire tiles, and the bedrooms have boarded floors. The kitchens contain Yorkshire ranges, and the bedrooms and living-rooms registered stoves. The total amount of the contract is 5,600*l.* The contractors were Messrs. Hewins & Goodhand; the plumbing work has been done by Messrs. Kennington & Dolby, the smith and iron-foundering by Mr. W. C. Sharpe, and the painting by Messrs. Heseltine & Speechley, while the grates have been supplied by Messrs. Goldthorpe & Shuttleworth. Mr. H. C. Scaping was the architect.

CLUB BUILDINGS, MEXBOROUGH.—The Constitutional Club premises, recently formed at Mexborough by extensive additions and alterations to existing buildings, were opened on the 2nd inst. The work has cost about 500*l.* Mr. W. Shepherd of Mexborough was the contractor; and the decorations were carried out by Mr. W. Nicholson. The architect was Mr. G. White, of the same place.

SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS, HEXHAM. — These works, which are nearly completed, are constructed on the septic system, and are built almost entirely of concrete. According to the *Newcastle Leader* they consist of a duplicate tank, each half of which is 55 ft. long and 9 ft. broad, and of six filters, each of which is 30 ft. long by 20 ft. broad. The sewage is discharged into the tank through iron traps, which are sealed to a depth of 2 ft. 6 in., thus making it impossible for the gas generated in the tank to get back into the sewer. In the tank, the sewage is submitted to the action of germs, by whose agency the whole of the solids are liquefied. The liquid then passes through outlets—also securely trapped—into an aerating trough, and falls over each side of the trough in a thin film, the germs being destroyed by the action of the air. Thence the effluent passes into the filters, and is submitted to the action of other germs. The filters are worked in pairs by automatic gearing. Each works continuously for four hours and rests for twenty, so that the whole of the six filters come into use by rotation every twenty-four hours. They are usually filled with ashes, coke breeze, and furnace clinker, but by way of experiment two of the filters at Hexham will be supplied with broken bricks instead of clinker, with the consent of the patentees of the system. In the centre of the tank there is an inspection chamber or shaft, fitted with plate-glass lights, through which the process of decomposition may be observed. The gas generated in the tank will be used for illuminating purposes. The works are expected to be in active operation shortly, and it is believed that the sewage effluent, after treatment, will be pure enough to meet all the requirements of the Rivers' Pollution Act. The plans and specifications were drawn up by Mr. R. T. Surtees, Surveyor to the Urban District Council.

PROPOSED HARBOUR, LOWESTOFT.—The *East Anglian Daily Times* states that with a view to avoiding, if possible, the great outlay for protection works on the Denes at Lowestoft, a suggestion, which was made some sixty years ago has been revived at Lowestoft, namely, the making of a harbour of refuge on the Denes, and the provision of wharves, docks, warehouses, &c. Lowestoft boat owners, in common with the residents generally, have realised with serious concern the denuding of their beaches, and the possible permanent flooding of the Denes. Now, after a lapse of sixty years, a suggestion has been made that the Denes belonging to the Corporation, south of the Model Yacht Pond, should be offered to a railway or other company with a view to the construction of a new harbour with docks, wharves, &c. A memorial on the subject has been prepared for presentation to the Town Council.

GASWORKS' EXTENSION AND PRIVATE STREET IMPROVEMENTS, NELSON, LANCS.—On the 31st ult., at Nelson, a Local Government Board inquiry was held into the application of the Nelson Town Council for sanction to a loan of 40,000*l.* for the purpose of gasworks' extension, and of 20,000*l.* for the purpose of private street improvements. It was stated by Mr. R. Prescott, the Town Clerk, that the old Local Board acquired the gas undertaking in 1866, and owing to the growing wants of the district the Brierfield Gasworks were purchased for 20,000*l.* in 1888. The statutory limits of supply were increased, and the 40,000*l.* then applied for was for the development of the Brierfield Gasworks, which were better situated than those at Nelson. The Chairman of the Gas Committee said that some of the money applied for had been expended, and an open borrowing clause had been obtained in respect of the gas undertaking. The annual output of gas was 190,000,000 cubic feet, as compared with 6,000,000 thirty years ago. The storage capacity was 2,500,000 cubic feet, and the price of gas was 2s. 6d. per thousand cubic feet in the borough, and 2s. 9d. outside the borough.

PROPOSED PIER, BEXHILL.—The pier shortly to be constructed at Bexhill is peculiar as having the pavilion at the western side of and about half-way down the pier proper. The site acquired is in the centre of the west esplanade, facing Egerton Park. The pavilion will be so arranged at the side as to be used without interference with the promenade or landing stage business of the structure. Concerts, theatricals, and musical entertaiments generally, will be provided for, with seating for 1,500 persons. The pier-head beyond will provide for open-air entertainments, with 1,000 chairs, protected by glazed wind screens. The landing-stage at the pier-head will taper seaward terminating in a semi-circular dolphin, making the total length of the pier 1,515 ft. The cost is estimated at 25,000*l.* The engineers are Messrs. Mayoh & Haley.

SEWERAGE WORKS, GAINFORD.—The sewerage works at Gainford have now been completed, and were handed over to the Barnard Castle Rural District Council on the 29th ult. The settling tanks and irrigation works are situated near the river Tees, opposite Black Scar. The sewage runs by gravitation from the village to the settling tanks, where it is treated with a precipitant, and the effluent conveyed in pipes to any one of the seven irrigation beds, which together are about 1½ acres in extent, and through which it percolates and makes its way into the river Tees. The collecting tank is furnished with a syphon for discharging intermittently. Each such discharge delivers on the irrigation bed which happens to be under treatment 1,275 gallons of sewage water which has passed through the settling tanks, where it had been freed from a great part of its solid matter, into the collecting tank, where further settlement takes place, while the tank is slowly filling. In the settling tanks the usual sludge-pumps are dispensed with, and the sludge is shot out through a 9-in valve into a sludge-pit near the settling tanks, but at a lower level, where it drains and dries ready for carting away. The cost of constructing two miles of sewers with the attendant flushing chambers, manholes, settling tanks and 2¼ acres of drained and levelled irrigation beds and other works, has been 1,770*l.* Mr. P. O. Hetherington was the contractor, and the engineer was Mr. Robert Robinson, M.Inst.C.E., of Darlington.

NEW LIGHTHOUSE, ST. MARY'S ISLAND, CURRY POINT, NORTHUMBERLAND.—On Wednesday, the 31st ult., the new lighthouse erected on St. Mary's Island was opened in presence of a number of people. It was built to displace the old lighthouse which stands on the Priory Point, Tynemouth, overlooking the entrance to the Tyne, the light of the latter being discontinued simultaneously with the illumination of its successor. The construction of the new light has occupied over two years. The buildings are of Heworth stone, and are of a most substantial character. The tower is of brick covered with cement, three quarters of a million bricks having been used in its construction. The light-house is circular in shape, and 120 ft. high from base to vane. The lantern is reached by a corkscrew staircase of 145 steps, and the illuminant is of the first order dioptric apparatus, with 5-wick Trinity House burner in focus, paraffin being used as the illuminant. The weight of the revolving lens is four tons, and it is floated in mercury on a supporting frame weighing seven tons. The intensity of the beam is 121,500 candles in thick weather, and 81,000 in clear weather. It gives two flashes in quick succession every twenty seconds, and will be visible in clear weather at a distance of 17 miles. The contract for the lighthouse has been carried out by Mr. J. L. Miller of Tynemouth, and Messrs. J. Tweddle & Co., of Newcastle, provided the iron-work. The lantern was designed by Mr. T. Matthews, C.E., engineer-in-chief to the Board.

BRIDGE, MILLBRAE, GLASGOW. — A memorial stone of the new bridge over the river Cart was laid on the 31st ult. The new bridge, which replaces the ancient structure which was only 12 ft. wide, is being constructed immediately to the west, and is 50 ft. in width. It is being erected at the cost (4,500*l.*) of the County Council of Renfrew and the Corporation of Glasgow. It is built of Locherbriggs stone, with ringheads, springers, and parapet of grey granite, and the inside arch of white rock. The waterway is 51 ft. wide, and the span of the bridge 50 ft. The abutments are to be surmounted by ornamental railings in extension of the parapet. The builders are Messrs. Morrison & Mason, Limited, of Glasgow; and Messrs. John White & James Lang, of Glasgow, are joint engineers.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, ST. NICHOLAS' CHURCH, BLUNDELLSANDS. — A stained glass window, in memory of Lady Mary Forwood, has recently been placed at the south-west corner of this church. The subject is Dorcas. On the left side she and her maids are engaged with the needle in the cause of charity, symbolical of the work of the late Lady Forwood. Dorcas' dress is green, whilst those of the other workers are blue and red, which, with touches of yellow and white, are clearly outlined. On the right side of the window Dorcas is seen with the result of her labours, and almost naked beggars at her feet, imploring of her garments wherewith to clothe themselves. On the left side of the window is the text, "Give, and it shall be given unto you." Below the window is the inscription, "In loving memory of our mother, Dame Mary Eleanor Forwood, obit December 24, 1896. Age 54."

FOREIGN.

FRANCE.—Since their first failure to find an *entrepreneur* for the Paris Metropolitan Railway, the municipality have made a second attempt on a new system, by dividing the proposed line into eleven sections for which the contracts are to be let separately. Of these, nine have been at last taken up. The remaining two sections, that between Rue de Reuilly and the Tuileries, and that between the Place Victor Hugo and the Porte Dauphine, are still going begging, and will probably have to be carried out by the municipality itself.——The fine fountain by Carpeaux, in the Avenue de l'Observatoire, Paris, is undergoing extensive repairs. ——M. Molinier, who had been appointed to organise the retrospective exhibitions of the art section in the 1900 Exhibition, has resigned his post.——There is talk of the sale of the fine estate of Bagatelle, in the Bois de Boulogne, where Sir Richard Wallace lived for a long time. In the event of the sale taking place, there is no doubt that the Commission des Monuments Historiques will intervene to prevent the destruction of the château, which is connected with many historical associations.——A committee has been formed to raise a monument in Paris to the memory of Auguste Comte.——The municipality of Sens have opened a competition for the construction of a new Hôtel de Ville at an estimated cost of 600,000 francs for the building, apart from decoration and fittings.——A very large almshouse has been opened at Lillebourne, built from the plans and under the superintendence of M. Jacques Lequeux. ——A monument to Marshal Junot, otherwise known as the Duc d'Abrantes, was inaugurated last week at Montbard. M. Pierre Degré is the architect.——M. Victor Prouvé, the painter who carried out the fine decoration of the grand staircase of the Mairie of Issy-les-Moulinaux, has just completed the studies for an important decoration commissioned by the Municipal Council of Paris, for the Mairie of the XIth Arrondissement.——M. Puvis de Chavannes has had the misfortune to lose his wife (née Princess Marie Cantacuzène), who has been long ill.——The death is announced of M. Lanier, and that of M. Lucet, architects, both of Paris.

NEW SOUTH WALES.—The last Report of the Public Works Department of New South Wales, recently issued, reports the public works for the year ending June 30, 1897; the report is dated 1898. In the department of railway and tramway construction four short lines, of a total length of about 107 miles, have been completed and opened for traffic. Three of these are lines of the "pioneer" class, and are intended to afford railway communication in those tracts of level country where the amount of traffic procurable is not sufficient to justify the heavy expenditure entailed by the construction of a thoroughly equipped railway. They have been designed and carried out in the most economical manner, with the result that the average cost per mile was only about 2,028*l.*, being some 1,700*l.* per mile less than the cost of the cheapest "light line"—namely, Nyngan to Cobar—hitherto constructed in the colony. It is added that the benefits accruing to the country from these lines have surpassed all anticipations. A short extension designed to connect Darling Island with the Darling Harbour Line was commenced towards the end of the year. In order to meet the ever-growing demand for wharf accommodation in the Port of Sydney, it was decided to utilise the extensive and valuable water frontage of Darling Island, and it thus became necessary to connect it with the Darling Harbour Line. The extension will consist of a double line of railway, and a contract for the formation of the first length of twenty-one chains is now in progress. The construction of two other lines has been authorised by Parliament, viz., Berrigan to Finley (thirteen miles), and Tamworth to Manilla (twenty-nine miles). The principle tramway in progress is the George-street and Harris-street Electric Tramway, which will consist of a double track throughout its whole length of 3 miles 20 chains. The overhead-wire system has been adopted for this tramway after a very careful examination into the merits of the various methods of electric traction in use throughout the world. Various schemes for the improvement of the entrances to the seven principal northern rivers, by means of the construction of guide-banks, training-walls, and breakwaters, have made good progress during the year, and the regular work of maintaining and improving the efficiency of Newcastle Harbour by removing reefs, dredging, reclamations, alterations and additions to the wharfage accommodation, &c., has been steadily pursued during the year. Extensive preparations have also been made for the construction of the Southern Breakwater and guide-wall, and a scheme for the construction of a deep-water harbour at Port Kembla has occupied a good deal of the engineer's attention during the year, the want of a sheltered coast harbour where vessels might safely load and unload in all states of the weather having long been held to be a serious obstacle to the development of the coal trade and commerce of the Illawarra district, and the general consensus of opinion pointed to Port Kembla as the most suitable and convenient site for the construction of such a harbour. For Metropolitan water supply construction, a new high-level covered reservoir, capable of holding 17,000,000 gallons of water, is being constructed on a site in Centennial Park. It will occupy an area of about $3\frac{1}{3}$ acres, will be oval in form, and a special feature in its design will be a groined coke-concrete roof. During the year water supply works were completed for the towns of Armidale and Parkes, and the construction of water supply works for Tamworth was in progress. These are all gravitation schemes. During the year 124 new bridges (including fifty-three renewals) were completed and opened for traffic, aggregating 13,483 ft, in length, and consisting of 357 plain timber beam spans, twenty timber truss spans, one steel lift span, and four masonry and brick arch spans. With the exception of the steel lift span at Swan Hill and the three steel spans at Wallis Creek, Maitland, all these bridges are constructed of timber, though in many cases iron or concrete piers and abutments have been used. In the Government Architect's branch the expenditure for the year reached the amount of 250,152*l.* 6s. 8d. The new buildings completed during the year comprised four post and telegraph offices, three district lands offices, six court-houses, five police-stations, and six lock-ups. The Paramatta Court-house, of which a view is given, is a building with a good deal of picturesque character. The preparation of designs and plans for the proposed new Houses of Parliament for the colony has, during the year, occupied much of the time and close personal attention of the government architect and a special staff of assistants. The inadequacy of the present building has long been admitted. So far back as 1860 competitive designs for new Houses of Parliament were invited by the Government of the day, but no use was made of those received. The designs and plans submitted by Mr. Vernon, the Government architect, for consideration by the Parliamentary Standing Committee on Public Works provided for a council chamber with accommodation for eighty members or more, and an assembly chamber for 182 members, with a capacity for increase of accommodation suitable for 294 members. At the request of the Committee, Mr. Vernon prepared two additional designs, one for altering and improving the accommodation in the present building, at a cost of from 10,000*l.* to 15,000*l.*, and the other for a new building which could be erected for about 250,000*l.* Since the close of the year under review the Committee has recommended the adoption of the scheme submitted by Mr. Vernon providing for alterations to the present building at a cost not exceeding 15,000*l.* In the opinion of the Committee, the existing building, with the proposed alterations, should suffice for the business of Parliament for many years to come, and, therefore, the erection of new Houses of Parliament may be deferred.

MISCELLANEOUS.

NATIONAL REGISTRATION OF PLUMBERS.—A public meeting will be held in the Mayor's Parlour, Manchester, on the 19th inst., at which the Lord Mayor will distribute the prizes, certificates, and bronze medal of the Plumbers' Company, awarded in connexion with the recent Exhibition of Plumbers' Work at Manchester. The programme will include a lecture on "The Registration of Plumbers' and Domestic Sanitation," by Dr. Mansel-Howe, of London.

PUBLIC BATHS, BANBURY.—A Local Government Board enquiry was held at the Town Hall, Banbury, on the 1st inst., respecting the application of the Town Council for sanction to borrow 1,000*l.* for the improvement of the baths. There was no opposition to the scheme. The population of the borough in 1891 was stated to be 12,768, the present estimated population being 13,000. The annual assessable value was 45,808*l.*, and the amount of outstanding loans 22,373*l.* The number of houses in the borough was 3,100, and the acreage 4,634 acres. The period for which the loan was asked was thirty years. On the dissolution of the late Board of Health in 1889 the borough was made coterminous with the district. The Borough Surveyor explained the plans as prepared by him, and the Inspector made one or two suggestions for the improvement of the scheme.

INDESTRUCTIBLE COMBINATION WASHERS.—These washers, manufactured by Messrs. Peters, Bartsch & Co., consist of rings of soft metal grooved outside, and holding in the groove packing material, such as asbestos, rubber, hemp, &c. The soft metal, in conjunction with the packing, is intended to accommodate itself regularly to any unevenness in unplaned flanges, while the rings protect the packing material against injury from the action or pressure of steam. We have had no experience of the washer in actual wear, but it seems calculated to be both efficient and durable.

PUBLIC WORKS, WALLSEND.—A Local Government Board inquiry was held at Wallsend on the 2nd inst. respecting an application made by the Urban District Council to borrow about 5,000*l.* for the formation of a new road and quay on the east side of the township, 3,885*l.* for works of public and private street improvements, and 5,000*l.* for the purpose of public walks and pleasure grounds. The Clerk of the Council said that the reason the Council had resolved to take steps to put the improvements named into effect was due exclusively to the extraordinary development of the town consequent upon the shipbuilding and engineering industries, and the recent re-opening of the coalfields in the immediate neighbourhood. No less than 48,000 tons of shipping had been set afloat in 1897 by the firm of Messrs. C. S. Swan & Hunter, or about one-fourth of the shipping launched on the Tyne that year. The population in 1861 was 2,371; in 1871, 4,159; in 1881, 6,159; and in 1891, 11,620. The present population is 18,192. No fewer than 425 houses were at the moment in course of erection, 375 of which were on the flat principle. The immense rush of working men to the district necessitated enlarged household accommodation, the buildings at present in course of erection being sufficient to house some 2,000 workmen and their families.

PROPOSED ELECTRIC LIGHTING WORKS, REDDITCH.—On Wednesday, the 31st ult., a Local Government Board inquiry was held at the District Council Offices into the proposal of the Council to borrow 14,200*l.* for the purposes of the recently-adopted electric lighting scheme and other public improvements, including 11,000*l.* electric lighting, 700*l.* for street improvements, and 2,500*l.* for purchasing land for electric-lighting works and other purposes. It was stated that the annual assessable value of the urban sanitary district was 31,153*l.*; the outstanding loans under the Sanitary Acts, 13,111*l.* 8s. 5d.; the number of houses, approximately, 3,000. The population at the last census was 11,295, and the estimated population now was 14,500.

STATUES, NATIONAL PORTRAIT GALLERY, EDINBURGH.—The *Scotsman* states that three additional niches on the façade of the Portrait Gallery, Queen-street, have been filled with statues, to be followed soon by three more. The first of those placed represents James I. of Scotland, called the Poet King. The attitude and accessories suggest the poet, while the robes and sword indicate a knightly personage. The second statue is that of Napier of Merchiston, the inventor of logarithms. The attitude of the figure is suggestive of deep meditation, and the costume is the picturesque long-sleeved, fur-lined mantle, doublet, and trunk-hose worn by men of learning of his time. Both of these statues are from the studio of Mr. D. W. Stevenson, R.S.A., who followed in the portrait of the king a likeness believed to be contemporary and authentic; while that of Napier was chiefly taken from the painting in the possession of Lord Napier of Ettrick. The third figure represents Alexander III. It is from the studio of Mr. W. Grant Stevenson, R.S.A., and, like the others, is 7 ft. in height. The king is represented in the costume of the period, as shown on the State seal, standing firmly on the right leg, with the left advanced. The arms, crossing the body, grasp the sceptre, whilst the cloak is thrown back over the shoulders. Below the figures the corbels have been carved with appropriate coats of arms, and the Board of Manufacturers have been experimenting to see the effect on the building of the names of the personages celebrated being emblazoned in gold on a band underneath them. Colour, it is also understood, will also be employed in a like experiment on the coats of arms. The three statues just described have been placed in niches at the east end of the building.

PUBLIC WORKS, BARRY, GLAM.—A Local Government Board inquiry was held on Friday, the 2nd inst., at Barry Dock, into applications made by the Barry Urban District Council for power to borrow 230*l.* for new works of street improvements, 450*l.* for works of water supply, 100*l.* for the erection of sewer gas destructors, 3,751*l.* for works of private improvement, and 8,000*l.* for providing a refuse destructor in Barry-road, Cadoxton. It was stated that the refuse of the district at present amounted to about twenty-two tons per day. The destructor will have a chimney 150 ft. high. The structure will be provided with two cells of fifteen tons each, so that the proposed destructor will have a converting capacity of 30 tons per diem.

ELECTRIC LIGHTING, LEYTON.—A Local Government Board inquiry was recently held at the Town Hall, Leyton, into the application of the Urban Council for sanction to borrow 5,000*l.* for electric lighting and 1,030*l.* for works of private street improvement, 680*l.* for works of sewerage, and 110*l.* for the provision of a public convenience at the junction of Woodhouse- and Harrow-roads. The Clerk of the Council explained that the loans already sanctioned for electric lighting were 33,160*l.*, the amount borrowed was 32,860*l.*, and the amount expended was 29,480*l.* The 5,000*l.* now asked for was for another extension of the works.

BUILDING TRADES IN NORTH STAFFORDSHIRE.—The building trade in North Staffordshire still remains in a fairly prosperous condition, and from all towns comes the report that the operatives are well employed. There is a slight falling off, however, at the northern end of the district, but this up to the present has not affected the operatives. Bricklayers are working full time, with none out of employment. Joiners are busy. Stone-masons in all yards are well employed. Plasterers keep busy. Painters and plumbers are moderately employed. In the brick and tile yards throughout the district the operatives are busy. At Leek all branches of the trade are busy, and in some cases there is a scarcity of men. At Crewe good trade is still reported from all branches. At Stafford business is reported as falling off, several large jobs having been completed, and there are a few men out in most branches. At Cheadle there has been a great impetus given to the trade of late, and there are more general buildings in course of erection than for years past. All classes of operatives are well employed, and there are none out of work.—*Staffordshire Sentinel.*

CAPITAL AND LABOUR.

STRIKE AND LOCK-OUT AT ABERDEENSHIRE GRANITE QUARRIES.—The labourers at Dancing Cairns and Sclattie quarries have struck for a rise of a penny an hour in wages. This being refused, the drillers came out in sympathy, and about 140 men, including sett-makers, are now idle. Notices of a general lock-out have been given at other quarries, which, if carried out, will cause a suspension of building in Aberdeen, as well as of the export trade.

STRIKE OF MASONS, BARRY, GLAM.—The *Western Mail* remarks that a number of stonemasons have come out on strike at Barry Dock. It appears that non-society men are employed on different works in the town, and this the society hands have not been slow to resent. On Thursday, the 1st inst., the society men in the employment of Messrs. Rendell & Molton on certain new road works in the town gave notice that unless the "free" hands were taken off the job forthwith they would come out on strike. The request was not complied with, and the society men consequently came out. The difficulty is likely to spread unless the objection is removed, especially as the rules of the Stonemasons' Society distinctly specify that no member of the society can work with a non-society man.

LEGAL.

A BUILDING DISPUTE SETTLED.

THE case of Webster *v.* Raphael Tuck & Sons, Limited, again came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 7th inst., on the application of the plaintiff to restrain the erection of buildings, &c.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Technical Instruction School	Shrewsbury Corp.	20l.; 10l.	Oct. 29
*Extension of Covered Market	Aberavon Corp.	20 guineas	Dec. 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*New Sewers and Roads, Dulwich	The Governors, Alleyn's College, Dulwich	The Secretary, The Old College, Dulwich, S.E.	Sept. 14
*Water Supply, &c. Alterations and Additions	Hackney Union	W. A. Finch, Archt. 76, Finsbury-pavement, E.C.	do.
Drill Shed, Gwavas-lane, Newlyn Cornwall	1st C.V.A.	Capt. Runnalls, Alexandra-road, Penzance	do.
Schools, Hemsworth, nr. Wakefield	Hemsworth Sch. Bd.	W. E. Richardson, Archt. Bond-st. Leeds	do.
Church, Mansfield-street, Belfast	St Michael's Church Vestry	W. H. Stephens, Surv. Donegall-square North, Belfast	do.
Drainage Works, Shoreham	Sevenoaks R.D.C.	E. Wood, Surv. Shoreham	do.
*Additions to Timber Goods Shed, Painting, &c. Works	Midland Ry. Co.	Co.'s Archt. Cavendish House, Derby	Sept. 15
House and Shop, Manor-st. Bridlington Quay	J. Castle	J. Earnshaw, Archt. Wellington-rd. Bridlington Quay	do.
Additions to Workhouse	Easingwold Union	F. I. H. Robinson, Union Offices, Easingwold	Sept. 16
Workhouse Improvements	Mallow (Ireland) Union	M. Regan, Poor Law Office, Mallow	do.
Two Shops, &c. Station-rd. Aldershot	R. S. Blades	Friend & Lloyd, Archt. Aldershot	do.
Six Houses, New-st. Londonderry	———	R. E. Buchanan, Archt. 33, Shipquay-st. Derry	Sept. 17
Bridge Works	Evesham R.D.C.	H. S. Harvey, 10, Albert-road, Evesham	do.
Baths at Workhouse	Dungarvan (Ireland) Union	J. R. Dower, Union Offices, Dungarvan	do.
Hospital, House, &c. Cressing-road	Braintree Jnt. Hospital Board	H. H. Nankivell, Archt. Board's Offices	do.
Reading Room, Barrowby, Grantham	———	Canon Welby, Barrowby Rectory, Grantham	do.
*New Town Hall	Henley-on-Thames Corp.	The Town Clerk, Henley-on-Thames	do.
Sewerage Works	Lytham (Lancs.) U.D.C.	Messrs. Newton, Engr. 17, Cooper-st. Manchester	Sept. 19
Alterations to Turton Hall, Gildersome, Yorks	———	Buttery & Birds, Archt. Morley	do.
*Buildings for Electricity Works	Gloucester Corp.	H. A. Dancey, 26, Clarence-street, Gloucester	do.
Engine Foundations, &c. Springhead	Hull Corp.	F. J. Bancroft, Engr. Town Hall	do.
Additions to National Schools, Wethersfield	———	F. Wenden, Ivanhoe House, Wethersfield, Essex	do.
Public Convenience, New Brighton	Wallasey U.D.C.	W. H. Travers, Engr. Public Offices, Egremont	do.
*Articles and Works	Rotherhithe Vestry	The Clerk, at Vestry Offices	do.
Cemetery Chapels and Lodge, Eashing-lane	Godalming Jnt. Burial Bd.	Welman & Street, Archt. Church-st. Godalming	Sept. 20
Alterations, &c. Public Wash-house, Steble-street	Liverpool Corp.	W. R. Court, Public Baths, Cornwallis-street	do.
*Underground Conveniences, Queenhithe	Corp. of London	Engineer's Office, Guildhall	Sept. 15
*Road-making and Paving Works	Lewisham B. of W.	The Surveyor, Town Hall	Sept. 20
*Broken Blue Guernsey Granite	Brentford U.D.C.	N. Parr, Surv. Brentford	do.
Science and Technical Schools	Leek T.C.	Sugden & Sons, Archt. Leek	Sept. 21
Alterations, Borough Hospital, Plymouth	———	G. D. Bellamy, Engr. 6a, Courtenay-st. Plymouth	do.
*Redrainage, Sanitary Work, and Fittings, Highgate	Holborn Guardians	H. W. Mellor, Surv. 17, Buckingham-st. W.C.	do.
Public Offices and School	Blaydon U.D.C.	T. C. Nicholson, Archt Blaydon-on-Tyne	Sept. 22
Club Buildings, Boroughbury, Peterborough	———	A. W. Rudcle, Archt. Boroughbury, Peterborough	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Warehouse, Stabling, &c. Preston-st. Bradford	W. Parkinson	Fairbank & Wall, Archt. Craven Bank-chambers, Bradford	Sept. 22
*Asphalte Paving	Portsmouth U.S.A.	The Town Clerk, at Town Hall	do.
Temporary Buildings at Asylum, Lewes	East Sussex Asylum Visitors	H. Card, County Surv. County Hall, Lewes	Sept. 23
*Cleft Pale Oak Boundary Fencing, Brockwell Park	London County Council	Parks Dept. Spring-gdns. S.W.	Sept 26
Rebuilding George Hotel, Chepstow	R. Hughes	Veall & Sant, Archt. Cardiff	do.
*Ventilating Columns and Stoneware Pipe Connexions	Beckenham U.D.C.	John A. Angell, Surv. Beckenham	do.
*Widening Roads	do.	do.	do.
*Jarrah Wood Paving Blocks	St. Marylebone Vestry	The Clerk, Court House, Marylebone-lane, W.	do.
New Bothy, &c. Parliament Hill, Cart Shed, &c. Southwark Park	London County Council	Archts. Dept. Spring-gdns. S.W.	Sept. 27
Two Service Reservoirs, Ore	Hastings Corp.	P. H. Palmer, C.E. Town Hall, Hastings	do.
*New Post Office, Ross	Commrs. H.M. Wks. &c.	Alan Paull, 6, Quality-ct. E.C.	do.
*Enlargement Walsall Post Office	do.	H.M. Office of Works, Storey's Gate, S.W.	do.
*Construction of Gas Holder	Eastbourne Gas Co.	H. E. Jones, Engr. Gas Works, Harford-st. Stepney	Sept. 28
Electric Lighting Plant	Bexhill U.D.C.	A. H. Preece, C.E. 39, Victoria-street, S.W.	do.
Hotel, Port Talbot, S. Wales	———	G. E. Robinson, Archt. Cardiff	Sept. 30
Rebuilding Premises, Diamond- and Sucher-street, Londonderry	Mrs. M J Hegarty	E. J. Toye, Archt. Strand Derry	do.
*Iron and Stoneware Pipe Sewers	Epping U.D.C.	Urban Smith, C.E. 41, Parliament-st. S.W.	Oct. 1
*Erection of Dwellings, Bethnal Green and Limehouse	L.C.C.	Archt.'s Dept. 17, Pall Mall East, S.W.	Oct. 4
*Steam and Hot-water Plant	Southampton County Lunatic Asylum	W. J. Taylor, County Surv. Winchester	Oct. 11
Gasholder Tank, &c.	Edinburgh and Leith Corp.	W. R. Herring, Engr. 25, Waterloo-pl. Edinburgh	Oct. 17
*Additions to Asylum, Cholsey	Berkshire Lunatic Asylum Com.	G. T. Hine, Archt. 35, Parliament-st. S.W.	Oct. 20
*Water Supply, City of Belem, Para, Brazil	Brazilian Consulate	———	Nov. 10
Alterations Business Premises, Bridge-street, Castleford	———	J. Schofield, 16, Lock-lane, Allerton Bywater	No date
Tenements and Villa, Dysart, N.B.	———	Swanston & Legge, Archt. High-st. Kirkcaldy	do.
Drainage Works, Monkton Farms, Monkna-h, Glam.	———	E. J. Williams, Archt. 14, High-st. Cardiff	do.
Villas, Ewell, Surrey	———	P. Field, Archt. 11, Victoria-st. S.W.	do.
Six Houses, Ashton-under-Lyne	———	T. D. Lindley, Archt. Ashton-under-Lyne	do.
Hotel, Banavie, Inverness	———	D. Cameron, Archt. Inverness	do.
Technical Schools, Oldbury	———	Wood & Kendrick, Archt. West Bromwich	do.
Building, Mount-road, Hinckley	Committee of Cottage Hospital	J. Wigg, Archt. Berridge-st. Leicester	do.
*Internal Plumbing Works, Fittings, &c. at Hospital, Newport, Mon.	The Directors	R. J. Lovell, Archt. 46, Queen Victoria-street, E.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Chief Engineering and Surveying Assistant	Leyton U.D.C.	130l.	Sept 16
*Electrical Engineer	Willesden D.C.	400l. &c.	Sept. 20
*Secretary and City Manager for Waterworks	York Waterworks Co.	300l. &c.	Sept. 21
*Assistant Examiner, Office of H.M. Works, &c.	Civil Service Commrs.	Not stated	Oct. 5

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. & xix. *Public Appointments, pp.* 242, xvii. & xix.

When the case was called on, counsel for the plaintiff stated that since the last adjournment the defendants had agreed to purchase the plaintiff's premises, and, subject to his lordship's permission, it had been arranged that an order should be taken to stay proceedings in the action without costs.

Mr. Alexander, Q.C., on behalf of the defendants, consenting to the application, his lordship made the order as asked.

APPLICATION TO RESTRAIN ERECTION OF BUILDINGS.

THE case of Coles and Others *v.* Salters Company came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 7th inst., on the application of the plaintiffs for an injunction to restrain the defendants from erecting buildings so as to interfere with their ancient lights.

On the application of the plaintiffs, his lordship directed that the motion should stand over for one week.

ALLEGED INFRINGEMENT OF ANCIENT LIGHTS IN SURBITON.

THE case of Philpott *v.* The Surbiton and Long Ditton, &c., Society, Limited, came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 7th inst. on a motion by the plaintiff to restrain the defendant society from erecting buildings so as to interfere with his ancient lights.

Upon the application of counsel for the plaintiff his lordship directed that the case should stand over for a fortnight in order that terms might be arranged between the parties.

ALLEGED INTERFERENCE WITH ANCIENT LIGHTS.

THE case of Warton *v.* Poulter (Limited) and others again came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 7th inst., on the application of the plaintiff to restrain the defendant by injunction from interfering with his ancient lights.

When the case was called on, counsel for the plaintiff said it had been arranged that the case should stand over for a week on the same undertaking of the defendants as before, but with this further undertaking, that the defendants should deliver copies of their affidavits by the 8th inst.

His Lordship: Very well, I suppose some of these light and air cases will come on some day.

"ARCHITECTURE" IN COURT.

MR. JUSTICE PHILLIMORE, sitting as Vacation Judge, on the 7th inst., again had before him the petition of Carl Hentschel & Co. to wind up Architecture, Limited, the petitioners being judgment creditors of the Company.

Counsel, in support of the petition, stated that since the matter was before the court last week (reported in the *Builder*), the petition had been re-advertised and fresh affidavits sworn and filed.

Nobody appearing to oppose the application, his lordship made the usual compulsory winding-up order.

BRIXTON ANCIENT LIGHTS CASE.

THE case of Kitson *v.* Saunderson came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 7th inst., on an application by the plaintiff to restrain the defendant from erecting, or continuing to erect or raise a wall or building now in course of erection on the west side of the plaintiff's premises in Vine-street, Brixton, so as to interfere with the light coming to her premises.

Counsel for the plaintiff stated that his client was the leaseholder for a long term of years of the premises in question, and the building complained of was erected on a piece of land which had hitherto been vacant for upwards of twenty-four years. The only possible access of light to the plaintiff's front hall was through a fanlight over the front door, and the building which the defendant had commenced to erect was a building which would, when finished, be four stories high, and within 5 ft. of the plaintiff's front door. The learned counsel stated that if this were allowed to continue the plaintiff's front hall would be in absolute darkness.

Mr. Alexander, Q.C., for the defendant, said that the affidavits did not disclose the plaintiff's title, viz., the assignment of the lease, nor was it made apparent from them that there had been any diminution of the light coming to the plaintiff's premises. He contended that if the plaintiff suffered any injury through the defendant's building it was a case for damages and not for an injunction.

In the result the case was ordered to stand over for a week, the matter in the meantime to be referred to some surveyor to be agreed upon between the parties to report to the court whether there was any appreciable diminution of light due to the defendant's wall as it was going to be erected, and if he found there was and could suggest a remedy, to supplement his report by adding that.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until October 17.

[1897.]—21,141.—PLASTER FOR WALLS, CEILINGS, &c.: *J. A. Jones.*—The claim is for an admixture of annealed slag with cements, lime, and powdered sand. To make a rendering coat, the inventor takes one unit of Portland cement, two units of annealed slag, half a unit of slaked lime, and half a unit of clean sand, and grinds them into a fine powder. For the finishing coat no cement would be used, but more lime would be added.

22,314.—KITCHEN RANGES, &c.: *E. Gleeson.*—To raise the fire closer up beneath the cooking utensils, the

rear end of the fire-grate bottom is pivotted on to the side of the fireplace, the underside of the grate bottom being acted upon by wypers on a horizontal bar also pivoted in the side plate of the fireplace. A socket piece secured to the bar carrying the wypers projects frontwards, and between the grate bars, the wypers being so formed as to support the grate bottom, when raised, without the aid of a rack and pawl.

22,612.—CHIMNEY-POTS AND VENTILATORS: *J. J. Green.*—On the foundation or base are fixed rows of louvres sloping upwards to assist in producing an up-draught. Above the louvres are fixed a series of rings, each formed of two conical rings placed with their narrow ends together, forming a >-shaped ring, having its open end outwards and super-imposed, so that a narrow slit is left between the outward edge of the rings. In some cases the >-shaped ring will be reversed, so that its smaller end shall be outwards, and the slit be left between its inward edges.

23,666.—SHADING STUMPS FOR THE USE OF ARTISTS, DRAUGHTSMEN, AND OTHERS: *S. E. A. Grunewald.*—The stumps have a flat cross-section, and are chisel-shaped. They may be formed by tightly folding up blotting or other paper, so as to give a flat cross-section, and can be hardened by pressure.

23,766.—BATHS, &c.: *Emily Miall.*—The device consists of a frame, extending across the bath, which will serve as a washstand, and carries a basin (to be tipped or inclined after use), with a towel-rail, soap-dish, sponge-tray, and so on.

[1898] 1,248.—MITREING MOULDINGS, &c.: *H. S. Parry.*—In a circular disc, which runs parallel with a block, are inserted two planing knives, or irons; about ¼ in. distant from the block at the opening runs a face-plate set at right angles, upon which the moulding or wood is placed, held firmly by one hand, and by the other hand the disc is set into motion; the face-plate or angle-board is screwed to a table or bench, a grip or clutch is provided for operating in a semi-circular opening, and can be moved to any angle required.

6,511.—PLASTIC MATERIAL FOR USE IN MAKING TILES AND OTHER MOULDED ARTICLES, AND IN MAKING FLOORS, WALLS, &c.: *J. T. Szek.*—The material is composed of sawdust, shavings of wood, wood wool, wood pulp, or cellulose; these are steeped in a solution of sulphate of magnesia, with or without borax, in the ratio of 1 lb. of sulphate for each gallon of water; the product, after being dried and pulverised, is mixed with magnesia or burnt magnesite, and may be further treated with the addition of diluted hydrochloric acid in such proportion that the pure acid amounts to about 10 or 15 per cent. of the total amount of water in the pulp or paste.

6,511A.—CONSTRUCTION OF FLOORS AND WALLS: *J. T. Szek.*—The floor is prepared thus: After being being levelled and cleaned, it is studded with nails projecting from ⅛ in. to ¼ in.; it is next covered with a suitable foundation, preferably a mixture of Sorrel's cement and sawdust; then it is covered with a layer of plastic material (as in specification 6,511, 1898, above), which may be polished with pumice-stone. Walls can be covered in a similar way.

9,006.—GULLEY TRAPS FOR DRAINS: *J. Alsop & J. Brightmore.*—The earthenware gully trap and box attachment are moulded in one piece, and are constructed in three different forms for (1) domestic use, (2) hospitals, barracks, and asylums, and (3) hot climates; (1) the box is charged with a disinfectant, the inner sides of the gulley are grooved to carry sewage into the disinfecting box, which has a perforated front; (2) the box is on each side and on the front of the gulley, which has a grooved shoot within; (3) the gulley is made of glazed earthenware, its inside is oval shaped, and the box is placed in front thereof. The gulleys may also be constructed of metal.

12,996.—CONNECTION WITH DRAINS, SEWERS, AND CHANNELS; AND JUNCTIONS, TRAPS, INLETS, COVERS, AND JOINTS: *E. A. Green.*—The several claims comprise the formation of the socket openings spherically concave and of the spigot ends spherically convex, so that their surfaces cover in section an angle of about 30 deg., and in the case of covers about 18 deg. at the centre of the sphere of formation; the combination in one piece of a main pipe or channel having spigot and socket ends, a branch pipe running into the same, with trap; the use of adjustable risers with spherically concave socket ends and spherically convex spigot ends; and the use and construction of a bend inlet having a rodding opening formed in its middle, at the back.

11,056.—STREET-SWEEPING MACHINES: *S. D. Lanyon & J. W. Tripp.*—In operation the motion of the axle communicates by gearing with the broom shaft, the endless elevator is driven positively by means of the carrying axle, and the conveyor is similarly driven by the sprocket chain and wheel gearing between the conveyor shaft and endless elevator's upper shaft. The dust is confined by specially-constructed fenders, hoods, and casing enclosures, and the broom may be raised or lowered by the driver.

14,304.—PROTECTING FROM MOISTURE THE PLASTERING OF WALLS, CEILINGS, &c.: *C. Fleisch.*—After removal of the defaced and moistened plaster, there are inserted, in its stead, battens of a waterproofed pulp board adapted at its back for the circulation of air and at its front for the adherence of fresh plaster; the insulating plate or board of roofing pulp or paper is painted on both its sides with layers of a hot mixture of bituminous materials, and has a net of hemp or jute spread over its surface for adherence of the plaster.

NEW APPLICATIONS.

August 22—27.

17,997, Millers, Acetylene Gas Lamps. 18,004, J. Hughes, Window Locking Bar. 18,009, L. Pollak, Corrugating, Fluting, or imparting an Ornamental Shape to Sheet Metal, &c. 18,026, C. E. Hadlow, Window Sashes. 18,057, L. Horwitz, Electrical Lamps. 18,063, K. G. Gustafson, Acetylene Gas Apparatus. 18,067, E. J. Shackleton, and 18,187, Crossingham & Hobbs, Circular Saw Guards. 18,072, B. Jones, Acetylene Gas Generators and Gasometers. 18,073, Johnson and Others, Flush-out Water Closets and Flushing Apparatus. 18,074, J. Wilson, Filter Presses and similar Filtering Apparatus. 18,079, J. L. Kail, Library Shelving. 18,080, Winslows, Shelving Construction. 18,081, W. H. Winslow, Metal Bound Boards for Shelves, &c. 18,082, Winslows, "Building Construction." 18,084, Cockburn & Hay, Machine Dies or Moulds for making Bricks, &c. 18,088, T. Nicholson, Preservation of Painters' Brushes when new from Moth, and for their conveyance when in use. 18,090, T. Taylor, Tubular Conduits for Electrical Wiring. 18,106, F. Gebhardt, Combined Rule and Compass. 18,116, A. W. Bird, Channel Beds for Drains. 18,119, Foxcroft & Duncan, Electrical Switches. 18,123, W. Spain, Rock Drills. 18,133, J. Kremer, 18,171, R. Checkley, 18,178, W. Walker, 18,220, E. Engasser, 18,435, I. J. Van Praag, and 18,436, G. Matthyssens, Acetylene Gas Generators. 18,149, A. J. Sterne, Gas Ignition. 18,150, E. L. Evens, Window Sashes for purposes of Ventilation. 18,159, J. Griffin, Draught Protector and Fastener for Window Sashes, Casements, Doors, &c. 18,169, D. C. Ripley, Glassware. 18,174, W. R. Pedler, Removing Lime from Bricks. 18,176, R. Beckett, Gate or Door Fastener. 18,177, R. J. Plenderleith, Combined Set-square and Protactor. 18,181, The Honourable Robert W. H. Roduey, Catches and Locks for Doors. 18,185, B. Harris, "A Rhomboid Chimney Flue Brick." 18,188, J. Mell, Asphalt Roofing for Buildings. 18,191, Cooke & Newton, Painting or Colouring the Curbing of Footpaths, Platforms, &c., for indicating their Outer Edge or Limit. 18,203, E. Buckingham, a Cabinet Stove. 18,209, Biss & Long, Wood-carving for Furniture, &c. 18,210, H. T. Grainger, Building Blocks or Bricks. 18,231-2, Bachmann and Others, Electrical Heating Appliances and Electrical Resistances of Artificial Stone. 18,249, Turtle & Scriven, Combination Square Centre or Radius Square, Bevel, and Angle Finder. 18,251, W. Oates, Urinals. 18,271, E. Weidlich, Cooling, Moistening, and Purifying the Air in Tunnels, Hospitals, Barracks, Schools, Factories, &c. 18,285, A. E. Greville, an Air Heater. 18,293, J. C. Ginzler, Coin-freed Gas and other Fluid Meters. 18,299, A. Ingram, Door Fastening. 18,303, S. J. H. Row, Metal Joint for Wood or Metal Rods and Tubes. 18,328, E. Rhodes, Gas and similar Meters. 18,331, Leaver & King, Holders and Fasteners for Sliding Windows. 18,345, Alexandrine Niel, née Janlot, Gas Flow and Pressure Regulator. 18,369, T. E. Andrews, Electrical Glow Lamp. 18,411, Wright & Darwin, Atmospheric Burners for Gas-heating Stoves. 18,426, W. J. Lewis, Slate and similar Mantelpieces. 18,441, E. T. Phillips, Wrenches or Spanners. 18,442, J. C. Montgomerie, Filter Presses. 18,445, Stevens & Barker, Clip for Attaching Pipes and Fittings to Iran or Steel Girders or Joists. 18,449, G. K. Cummings, Manufacture of Ornamental Windows, and Machines therefor. 18,451, J. E. Meredith, Adjustable Spanners.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 24.—By G. DURRANT & SONS (at Harleston).

Redenhall, Norfolk.—The Mill Farm and 84 a. 2 r. 27 p., f. £900

August 25.—By WOODHAMS & SON (at Bexhill).

Bexhill-on-Sea, Sussex.—The Pages Estate, 54 a. 0 r. 20 p., f. 10,000
The Downs, a freehold cottage, r. 25*l.* 570
18 to 21, Beaconsfield-rd., f. 1,000
Beaconsfield-rd., three plots of land, f. 226
Sidley, Sussex.—Ninefield-rd., a plot of land, f. .. 355

By CHADWICK & SONS (at Windsor).

Windsor.—Frances-rd., Frances House, with range of stabling and goodwill of a livery and bait stables, u.t. 11 yrs., r. 85*l.*; also Albany House, with range of stabling in rear, u.t. 68 yrs., g.r. 6*l.*, e.r. 87*l.* 1,120

August 26.—By MCINTOSH & CO.

Kennington.—37, Reedworth-st., u.t. 37 yrs., g.r. 5*l.* 10s., rising to 7*l.*, r. 42*l.*, with a covenant to renew for a further 37 yrs. 460
56, Reedworth-st., u.t. 41 yrs., g.r. 6*l.* 10s., rising to 8*l.*, r. 44*l.* 455

August 29.—By MORRIS & PLACE (at Loughborough).

Quorn, Leicester.—Four enclosures of land, 22 a. 0 r. 36 p., f. 2,620

By R. KING & SON (at St. Ives).

Pidley, Hunts.—Blacksmith's Close, 7 a. 2 r. 31 p., f. 260

August 30.—By C. W. DAVIES.

Belgravia.—80, Ebury-st. and 80, Ebury-mews, u.t. 25 yrs., g.r. 10*l.*, r. 147*l.* 1,210
Regent's Pk.—9, Sussex-pl. and 9, Sussex-mews, u.t. 23 yrs., g.r. 52*l.* 10s., r. 210*l.* 1,220
138, Albany-st. and 87 and 89, Little Albany-st., u.t. 31 yrs., g.r. 17*l.*, r. 100*l.* 900
74, Albany-st. and 37, Little Albany-st., u.t. 25 yrs., g.r. 14*l.* 10s., r. 103*l.* 700
Islington —461, Liverpool-rd. and 1, Bride-st., u.t. 30 yrs., g.r. 21*l.* 12s., r. 65*l.* 16s. 325
Canonbury.—Wallace-rd., improved ground rents of 198*l.* 9s., u.t. 27½ yrs., g.r. nil 2,680

By S. & G. KINGSTON (at Spalding).

Spalding, Lincs.—1 to 5, Henrietta-st., f. 1,745
7, Cross-st., f. 510

By NICHOLSON, GREAVES & CO. (at Scarborough).

Scarborough, Yorks.—North Cliff, "The Alexandra Hotel," area 3,875 yards, f. 12,000

By A. J. THORNE & SON (at Brentwood).

Brentwood, Essex.—Highland-av., six plots of land, f. 522

By TAYLER & GERRISH (at Chipping Sodbury).

Iron Acton, Glos.—Rose Cottage, and 20 a. 1 r. 23 p., f. 1,350
Pool Farm, 32 a. 0 r. 22 p., f. 895
Enclosures of pasture land, 5 a. 1 r. 3 p., f. 158
Old Sodbury, Glos.—Enclosures of land, 13 a. 1 r. 18 p., f. 700
Yate, Glos.—Enclosures of land, 3 a. 1 r. 5 p., f. 510

August 31.—By ALEX. PHILLIPS.

Kilburn.—46 and 48, Mazenoa-av., u.t. 97 yrs., g.r. 25*l.* 4s., r. 190*l.* 1,100
Marylebone.—119, Lisson-grove, u.t. 19½ yrs., g.r. 8*l.* 8s., e.r. 50*l.* 420

By ALFRED BOWYER.

Tottenham.—17 to 20, Beaufoy-rd., u.t. 78 yrs., g.r. 12*l.* 480

By JOHN M. LEEDER & SON (at Swansea).

Morriston, Glamorgan.—The Upper Forest Steel and Tinplate Works and the Worcester Tinplate Works, 45 a., with plant, machinery, &c., leases 88, 29, and 40 yrs., r. 742*l.* 2s. 88,000

By A. DOWELL (at Edinburgh).

Dunfermline, Fifeshire.—Parts of the lands of Blackburn, 60 a. 2,030

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 0/0/0
Teak, E.I.	load	9/5/0 14/5/0
Sequoia, U.S.ft.cu.		2/9/0 2/0/0
Ash, Canada, load		3/18/0 5/3/0
Birch, do.		3/7/6 5/0/0
Elm, do.		4/13/0 5/13/0
Fir, Dantsic, &c.		2/9/0 4/9/0
Oak, do.		1/18/0 2/18/0
Canada		3/13/0 4/18/0
Pine, Canada red		0/0/0 0/0/0
Do. yellow		4/3/0 6/3/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg		5/0/0 6/10/0
Wainscot, Riga, &c., log		4/10/0 6/0/0
Odessa, crown		4/10/0 6/0/0
Deals, Finland 2nd & 1st std	100	9/0/0 9/10/0
Do. 4th & 3rd		9/0/0 9/10/0
Do. Riga		7/10/0 8/10/0
St. Petersburg, 1st yellow		11/0/0 13/10/0
Do. 2nd yellow		10/0/0 11/10/0
Do. white		9/0/0 11/0/0
Swedish		9/10/0 16/0/0
White Sea		10/10/0 17/0/0
Canada, Pine 1st		18/0/0 24/10/0
Do. do. 2nd		13/0/0 15/15/0
Do. do. 3rd, &c.		6/0/0 9/10/0
Do. Spruce, 1st		8/10/0 10/10/0
Do. do. 3rd and 2nd		7/10/0 8/10/0
New Brunswick		7/0/0 8/0/0
Battens all kinds		5/0/0 16/0/0
Flooring boards, sq., 1 in. prep. 1st		9/6 16/0
Do. 2nd		8/0 13/0
Other qualities		6/3 7/0
Cedar, Cuba, ft.		/4 /4½
Honduras, &c.		/3½ /4½
Mahogany, Cuba		/5½ /7
St. Domingo, cargo av.		/5 0/6/3
Mexican, do. do.		/3½ /4
Tobasco, do. do.		/4 /6½
Honduras, do.		/4 /6
Box, Turkey, ton		4/0/0 15/0/0
Rose, Rio		7/0/0 24/0/0
Bahia		4/0/0 12/0/0
Satin, St. Doming.		0/0/5 0/1/0

TIMBER *(continued)*.		
Satin, Porto Rico		0/0/6 0/1/6
Walnut, Italian		0/0/3 0/0/7
METALS.		
Iron—Pig, in Scotland	ton	2/7/4½ 0/0/0
Bar, Welsh, in London		5/15/0 5/17/6
Do. do. at works in Wales		5/10/0 5/12/6
Do. Staffordshire, in London		6/5/0 7/10/0
COPPER—British cake and ingot		55/10/0 56/0/0
Best selected		56/0/0 56/10/0
Sheets, strong		61/0/0 61/10/0
Chili bars		52/3/9 0/0/0
YELLOW M.L.	lb.	5d. 5¼d.
LEAD—Pig Spanish	ton	13/0/0 0/0/0
English com. bands		13/5/0 0/0/0
Sheet, English 6 lbs. per sq. ft. and upwards		14/5/0 0/0/0
Pipe		14/15/0 0/0/0
ZINC—English sheet	ton	23/0/0 0/0/0
Vieille Montagne		23/10/0 0/0/0
Spelter		21/0/0 0/0/0
TIN—Straits		73/7/6 0/0/0
Australian		73/17/6 74/2/6
English Ingots		76/0/0 77/0/0
Banca		0/0/0 0/0/0
Billiton		0/0/0 0/0/0
OILS.		
Linseed	ton	17/2/6 0/0/0
Cocoanut, Cochin		27/15/0 0/0/0
Do. Ceylon		22/0/0 0/0/0
Palm, Lagos		21/15/0 0/0/0
Rapeseed, English pale		27/10/0 0/0/0
Do. Brown		26/0/0 0/0/0
Cottonseed ref.		14/5/0 15/5/0
Oleine		13/10/0 14/10/0
Lubricating U.S.		0/5/3 0/7/6
Do. Black		0/5/0 0/6/6
TAR—Stockholm	barrel	1/5/0 0/0/0
Archangel		0/12/6 0/0/0
Turpentine		22/12/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100 unless in some exceptional cases and for special reasons.]

ALDERSHOT.—Accepted for the supply of 2,000 tons of granite road metal, for the Urban District Council:—

	Per ton. 1½ in. size. s. d.	Per ton. 2 in. size. s. d.
C. M. Manuelle, Quenast granite	14 0	13 6
Kent Road Co., Cherbourg quartzite	13 9	13 6

AYLESBURY.—For erecting a detached residence Wendover road, Aylesbury, for Mr. E. T. Mackrill. Messrs. W. Taylor & Son, architects, Aylesbury. Quantities by the architects:—

W. Y. Green & Co.	£1,438	Webster & Cannon, Aylesbury*	£1,360
H. H. Sherwin	1,390		
Mayne & Son	1,378		

* Accepted.

BEXHILL (Sussex).—For the erection of walls, kerbing, paving, &c., for the Urban District Council. Mr. G. Ball, C.E., Council's Offices, Bexhill:—

E. Gutsell, Silverhill, St. Leonard's-on-Sea £614

BRENTFORD.—For the erection of house and office, Boston Brewery, Boston-road, for Messrs. Fuller & Co., Griffin Brewery, Chiswick. Mr. J. Hume, architect and surveyor, Chiswick:—

Hanson	£800 0 0	S. Hunt	£759 0 0
J. Barnes	830 0 0	Speechley & Smith	743 0 0
Adamson & Son	800 0 0	L. Leeder & Co.*	730 15 0
Dorey & Co.	789 0 0		

* Accepted.

CROMER.—For the erection of a residence, Cromer. Mr. R. W. W. Carter, architect, Cromer:—

Girling & Smith	£995	J. White	£897
J. Evans	975	J. Riches	848
H. Bullen*	900	Harrison & Blyth	815

* Accepted.

DEVONPORT.—For additions to workhouse infirmary, Stoke Damerel, for the Union Guardians. Mr. H. G. Luff, architect, 64, Chapel-street, Devonport:—

Pethick Bros.	£4,699 0	J. Goad & Co.	£3,600 0
Ambrose Andrews	4,300 0	Tozer & Son	3,486 0
G. B. Turpin	4,266 0	A. N. Coles	3,465 0
T. May	4,248 0	W. E. Blake	3,393 0
J. Partridge	4,100 0	Pellow, Plymouth*	3,296 0
Jillard & Stevenson	3,913 0	Smith & Son, Devonport (withdrawn)	2,849 15
J. H. Blackall	3,785 0		

* Accepted.

FERNDALE (Glam.).—For rebuilding two shops and premises in High-street, for Mr. W. R. Davies. Messrs. Edgar Down and A. J. Jones, joint architects, 1, City-chambers, Queen-street Cardiff:—

Jenkins	£1,355	Morris*	£1,080
H. Lewis	1,125		

* Accepted.

GUILDFORD.—For the erection of a house, Warren-road, for Mr. G. E. Wainwright. Messrs. Pictor & Lunn, architects:—

Mitchell Bros.	£2,770	Tribe & Robinson	£2,380
F. Milton	2,620	Kingerlee & Son	2,299
Goddard & Son	2,547	Brown Bros.	2,288
S. Ellis	2,495	Bottrill & Son, Reading*	2,248
Higlett & Hammond	2,450		

* Accepted.

HASTINGS.—For additions and sanitary works at the boys school, Hollington, for the School Board. Mr. Arthur Wells, architect, Queen's-chambers, Hastings:—

J. Cruttenden	£590 0	H. Ashdown	£440 6
John Lester	527 0	A. H. White	301 0
F. G. Hatton	480 10	Padgham & Hutchinson, St. Leonard's-on-Sea*	276 0
Chapman & Cuff	450 0		

* Accepted.

HASTINGS.—For additions, sanitary works, levelling playgrounds, and other works at Sandown Schools, Old London-road. Mr. Arthur Wells, architect, Queen's-chambers, Hastings:—

J. Lester	£2,297 0	Padgham & Hutchinson	£2,130 0
F. G. Hatton	2,250 10	D. Snow, Hastings*	1,800 0
A. H. White	2,190 0		

* Accepted.

HASTINGS.—For additions to the girls' school, sanitary works, levelling playgrounds, and boundary walls at both the girls' and infants' schools, Hollington, for the School Board. Mr. Arthur Wells, architect, Queen's Chambers, Hastings :—

J. Lester	£1,577	A. H. White	£1,223
J. Cruttenden	1,560	Padgham & Hutchinson	1,186
F. G. Hatton	1,555	H. Ashdown, Hollington*	1,114
Chapman & Cuff	1,343		

* Accepted.

HOMERTON.—For alterations and additions at 27, Berger-road, Homerton, for Mrs. E. Knights. Mr. John Hamilton, architect :—

Snewin Bros. & Co. £499

ILKLEY.—For the erection of three villas. Messrs. Isitt Adkin, & Hill, architects, Prudential-buildings, Bradford :—

Masonry.—G. Smith, Ilkley	£1,318 12 6
Joinery.—Eagle & Mawson, Ilkley	685 17 6
Plumbing.—J. Houldsworth, Ilkley	217 4 0
Slating—J. Smithies, Bradford	101 11 0
Plastering.—R. Richardson, Ilkley	219 2 0
Painting.—J. Hankins, Manningham	33 0 0

LONDON.—For alterations and additions at No. 13, The Parade, Upper Clapton, for Mr. W. Finch. Mr. A. J. England, architect :—

Goodall	£447	Snewin Bros. & Co.	£390

LONDON.—For additions to 23, Rockmead-road, South Hackney. Mr. John Hamilton, architect :—

Snewin Bros. & Co. £177

LONDON.—For pulling down and re-building the "Blenheim," Cale-street, Chelsea. Mr. H. W. Budd, architect :—

Simmons Bros.	£4,393	Bush	£3,944
Prestage & Co.	4,025	Spencer & Co.	3,780
Martin, Wells & Co.	3,958	Snewin Bros. & Co.	3,725

LONDON.—For adding new cellars to Manor Stores, Chiswick, lane, for Messrs. Fuller & Co., Griffin Brewery. Mr. J. Hume, surveyor, 159, High-road, Chiswick :—

Speechley & Smith	£267 0	G. Allred	£256 0
M. N. Rhodes	258 10	L. Leeder (accepted)	249 0

LONDON.—For the erection of baths and washhouses for the Vestry of St. Matthew, Bethnal Green, including piled foundations, electric lighting, &c. Mr. R. Stephen Ayling, architect, Parliament-mansions, Victoria-street, S.W. Quantities by Mr. Henry Riley, 28, Victoria-street, S.W. :—

Leslie & Co.	£18,742	Perry & Co.	£16,287
Holland & Hannen	16,476	Rider & Sons	16,228
Bywaters	16,375	Nightingale	15,763
Holliday & Greenwood	16,332	H. L. Holloway*	15,103
Lawrence & Sons	16,293		

* Accepted.

LONDON.—For sundry additions and alterations to biscuit works, Shadwell, for Messrs. Meredith & Drew, Limited. Mr. Frederick Colyer, architect, 14, Victoria-street, Westminster, S.W. :—

S. G. Bird	£3,716	J. T. Robey*	£3,555

* Accepted, subject to variations.

PORTISHEAD.—For widening the lower portion of West Hill-road, Portishead, for the Portishead Urban District Council. Mr. T. J. Moss Flower, engineer, Carlton Chambers, Bristol :—

J. & T. Binns	£468 0 0	G. Biss & Son, Portishead*	£173 0 0
E. Monks	249 10 0		
J. Woolford	215 3 4		

* Accepted.

PLUMSTEAD.—For alterations, &c., at "The Star" public-house, Plumstead Common-road, S.E. Mr. I. O. Cook, architect :—

Hutton	£644	Thomas & Edge	£410
Kitley	426	Hodgin	£390

READING.—For rebuilding 54 and 55, Munster-street, for Mr. J. Sydenham. Messrs. Webb & Blackwell, architects :—

Kingerlee & Son	£2,995	G. S. Lewis & Bros.	£2,678
Collier & Catley	2,780	J. Bottrill & Son, Reading*	2,627
Higgs & Sons	2,730		

* Accepted.

SHOTLEY BRIDGE (Durham).—Accepted for the erection of cottage houses, for the Gateshead Union Guardians. Mr. W. L. Newcombe, architect, 89, Pilgrim-street, Newcastle-on-Tyne :—

W. C. Tyrie, Redheugh, Gateshead £15,095 13 0

SUNDERLAND.—For the erection of a technical college, Green-terrace, for the Corporation. Messrs. Potts, Son, & Hemmings, architects, London, W.C. Quantities by Messrs. Boreham & Morton, Sunderland :—

		Deduct for Terra-cotta.
Stott	£19,971	£258
Elliott	19,403	460
Gould	19,152	633
Howe	19,103	231
Shaftoe	18,796	477
White	18,562	976

SWANSEA.—For the erection of offices in Alexandra-road, Swansea, for the Poor Law Guardians, Swansea. Mr. Herbert W. Wills, architect, Swansea. Quantities by Mr. G. Fleetwood, 3, New-court, Carey-street, London :—

David Jenkins	£7,750	W. J. Morgan	£6,721
Weaver & Co.	7,003	Thomas Davies	6,650
Davies Brothers	6,840	Thomas Richards	6,580
Thomas Watkins & Co.	6,816	Bennett Bros.	6,500
Gustavus Bros.	6,803	Lloyd Bros. (accepted)	6,219

WOOLWICH.—For new workshop for Messrs Geo. Leavy & Co., Hare-street, Woolwich. Messrs. Church, Quick, & Whincop, architects :—

J. L. Holloway	£930	Thomas & Edge	£811
Proctor	900	J. Chapman	779
Munday & Son	825		

WOOLWICH.—For erecting new shop at 25, Hare-street, Woolwich, for Mr. G. Mitchell. Messrs. Church, Quick, & Whincop, architects :—

Turtle & Appleton	£2,240	J. Chapman	£2,195
Munday & Son	2,239	Goad	2,187
H. L. Holloway	2,200	Thomas & Edge*	2,180

* Accepted.

TO CORRESPONDENTS.

"Drains." (If it is a common sewer, the Vestry are liable to repair it; but whether the circumstances put it into the category of a common sewer, in the legal sense, it is impossible for us to say without detailed information and plans, or perhaps even then. The operation of the law on these points is still very uncertain.)

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS (by prepaying at the Publishing Office, 19s. per annum or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post*.

THE BATH STONE FIRMS, Ltd.
BATH,
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Doulting Stone Co.
(Incorporating The Ham Hill Stone Co. and C. Trask & Son The Doulting Stone Co.).
Chief Office :—Norton, Stoke-under-Ham, Somerset.
London Agent :—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

SPRAGUE & CO., Ltd.,
PHOTOLITHOGRAPHERS,
4 and 5, East Harding-street,
Fetter-lane, E.C. [ADVT.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.
METCHIM & SON { 8, PRINCES STREET, ST. GEORGE ST. WESTMINSTER
"QUANTITY SURVEYORS' DIARY AND TABLES," For 1898, price 6d. post 7d. In leather 1/- Post 1/1[ADVT.

Ernest Mathews & Co.
61, St. Mary Axe, E.C.
SLATES, SLABWORK,
Enamelled Slate,
Marble,
Permanent Green Slates.
WORKS:
Bow, London, E. and
Aberllefenny, North Wales.
BRANCH HOUSE:
37, Victoria-street, Bristol.

PILKINGTON & CO
(ESTABLISHED 1838),
MONUMENT CHAMBERS,
KING WILLIAM STREET, LONDON, E.C.
Telephone No., 2751 Avenue
Registered Trade Mark,
Polonceau Asphalte.
PATENT ASPHALTE and FELT ROOFING.
ACID-RESISTING ASPHALTE.
WHITE SILICA PAVING
SEYSSEL ASPHALTE.

W. H. Lascelles & Co.,
121, BUNHILL ROW, LONDON, E.C.
Telephone No. 270.
HIGH-CLASS JOINERY,
LASCELLES' CONCRETE
Architects' Designs are carried out with the greatest care.
CONSERVATORIES,
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, & Shop Fittings.
CHURCH BENCHES & PULPITS.
ESTIMATES GIVEN ON APPLICATION.

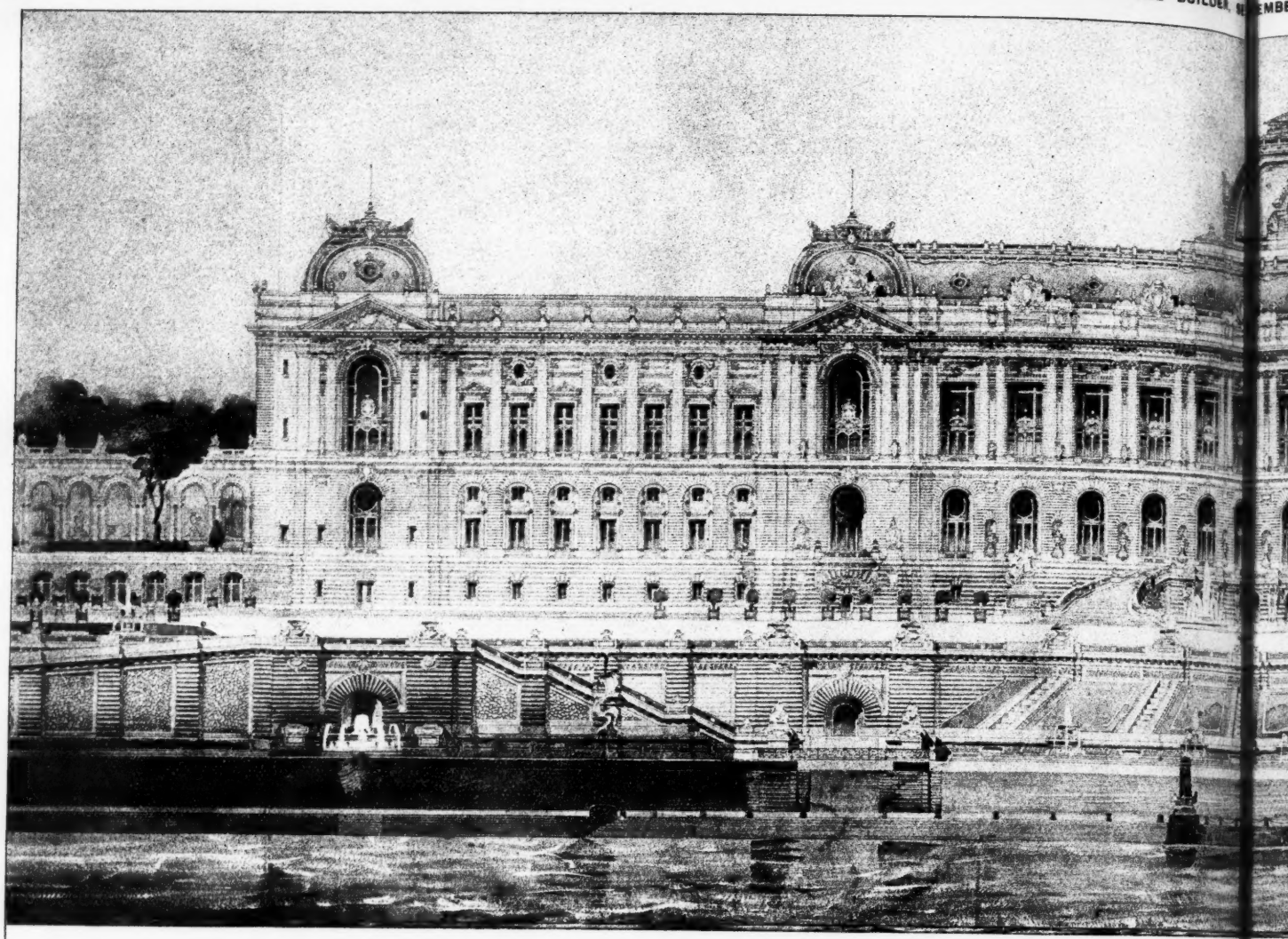
C. B. N. SNEWIN
MAHOGANY, WAINSCOT, WALNUT,
TEAK, VENEER, and TIMBER MERCHANT,
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGDON ROAD, E.C.
THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.
Telephone, No. 574 Holborn. Tele. Address: "SNEWIN, London.

BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

DIRECTORS.

CHARLES CREMER, Esq., Faversham, Kent, Brick Manufacturer.
R. L. CURTIS, Esq., 120, London-wall, E.C., Brick Manufacturer.
GEO. H. DEAN, Esq., J.P., of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.
E. W. GOODENOUGH, Esq., 37, Walbrook, E.C., Brick Manufacturer.
A. J. KNIGHT, Esq., Rainham, Kent, Brick Manufacturer.
HY. PACKHAM, Esq., of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.
A. RUTTER, Esq., of D. & C. Rutter, Parliament-street, Brick Manufacturers.
J. WILLSON, Esq., J.P., of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.
GEO. E. WRAGGE, Esq., of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

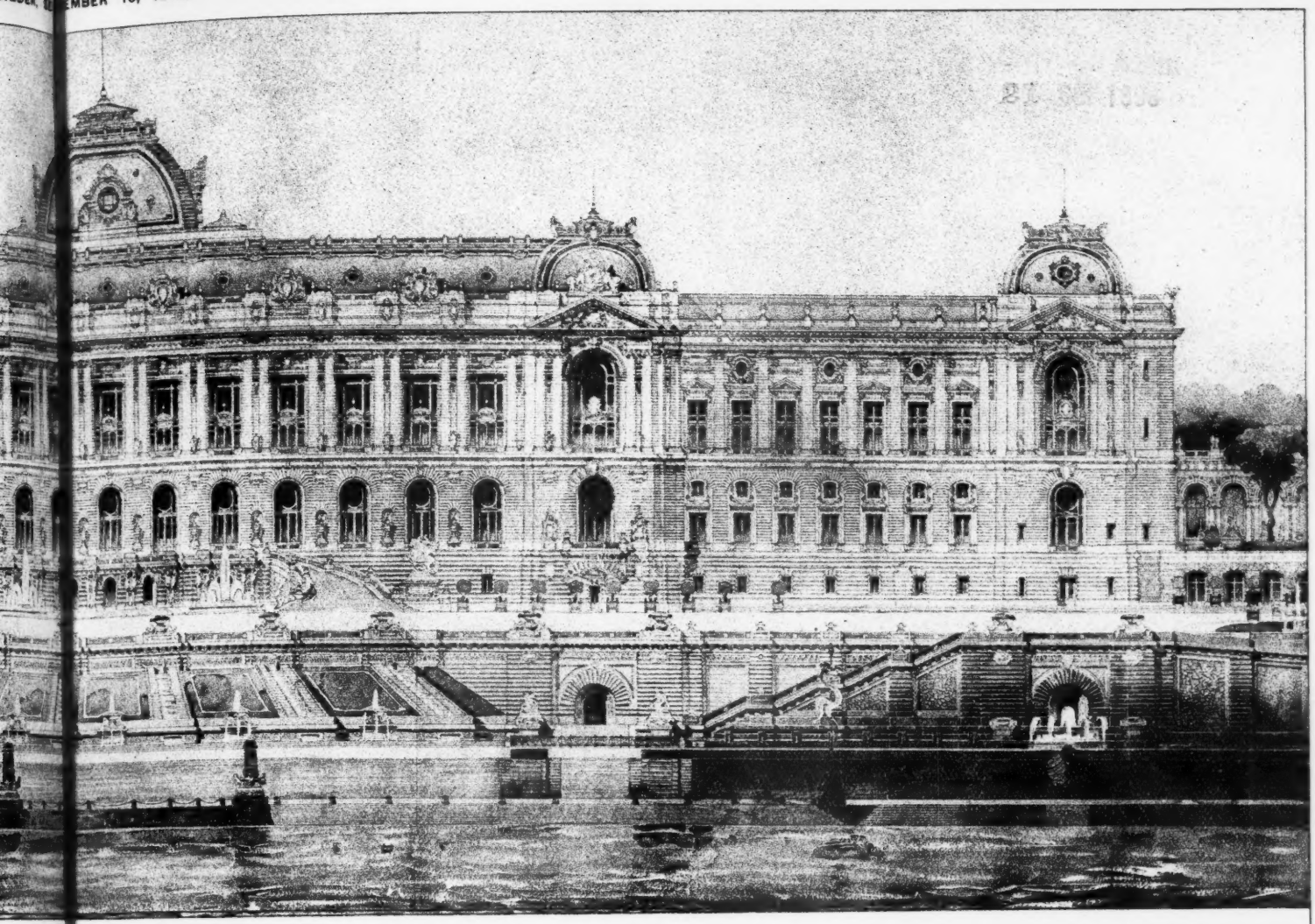
Secretary.—E. J. COLEBY, Esq., 148, Gresham House, Old Broad-street, E.C.



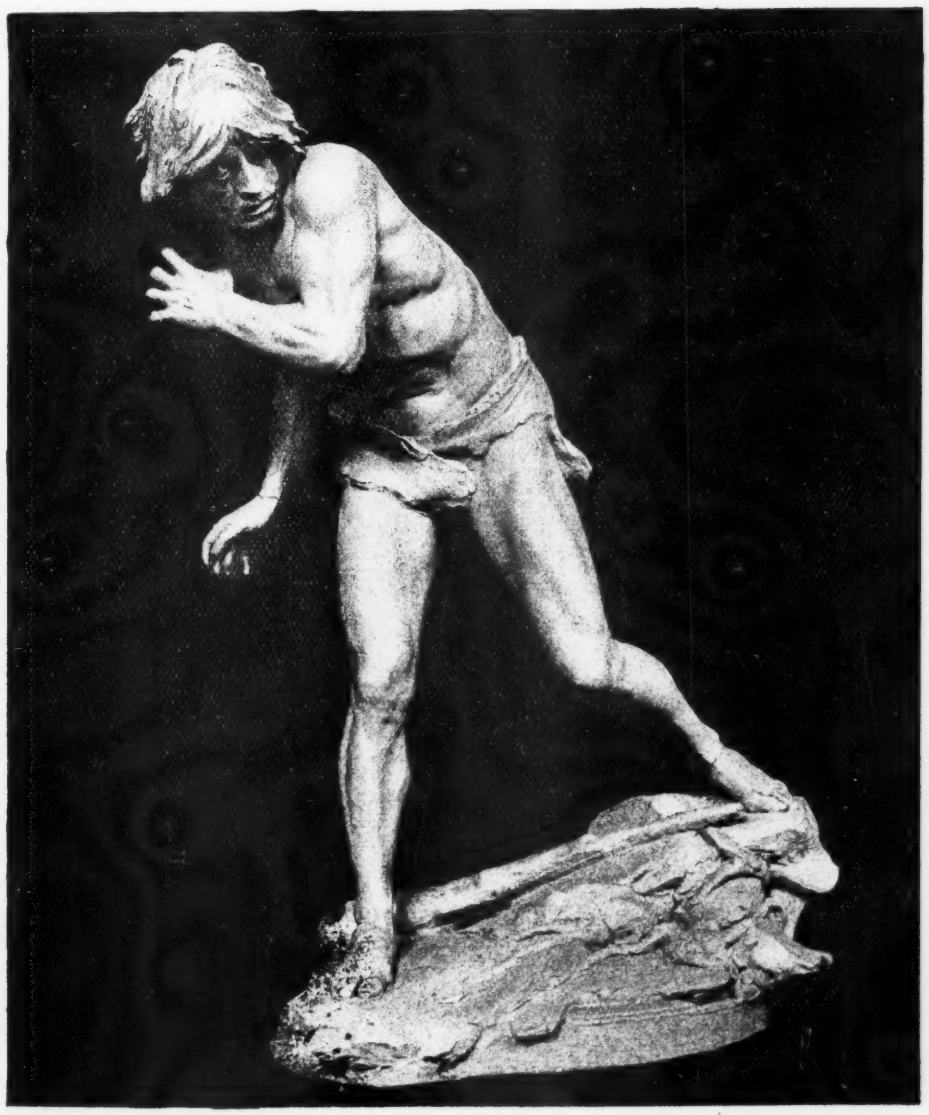
FIRST PRIZE IN ARCHITECTURE: "A PALACE FOR ENTERTAINING"

FIRST PRIZE IN PAINTING: "THE POOL OF BETHESDA."—By M. Gibert.

UNIV. OF MICHIGAN
21 SEP 1898



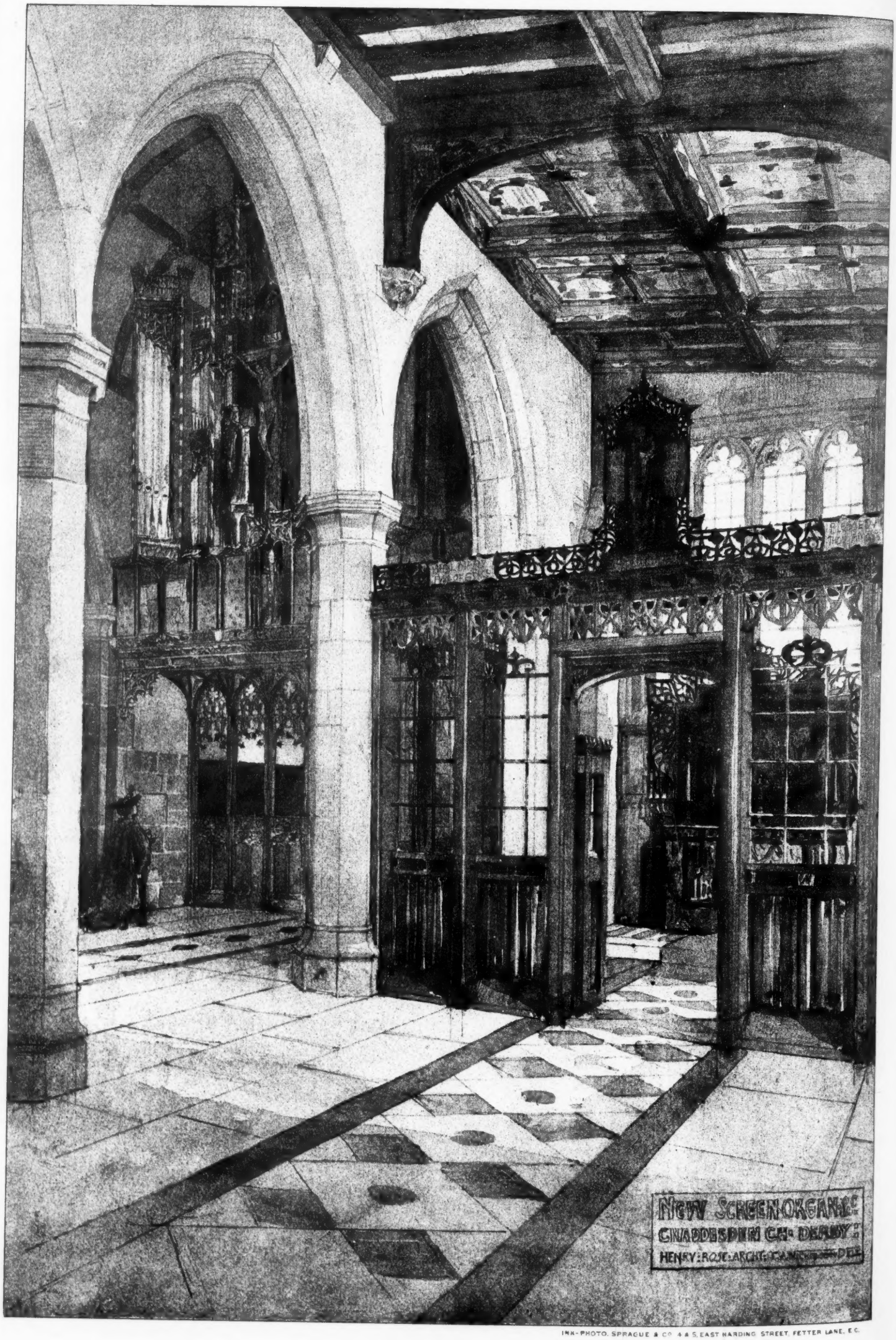
OR ENTERTAINING THE ILLUSTRIOUS GUESTS OF FRANCE."—By M. Léon Chiffelot.



SECOND PRIZE IN SCULPTURE: "CAIN AFTER THE DEATH OF ABEL."—By M. Boucher.

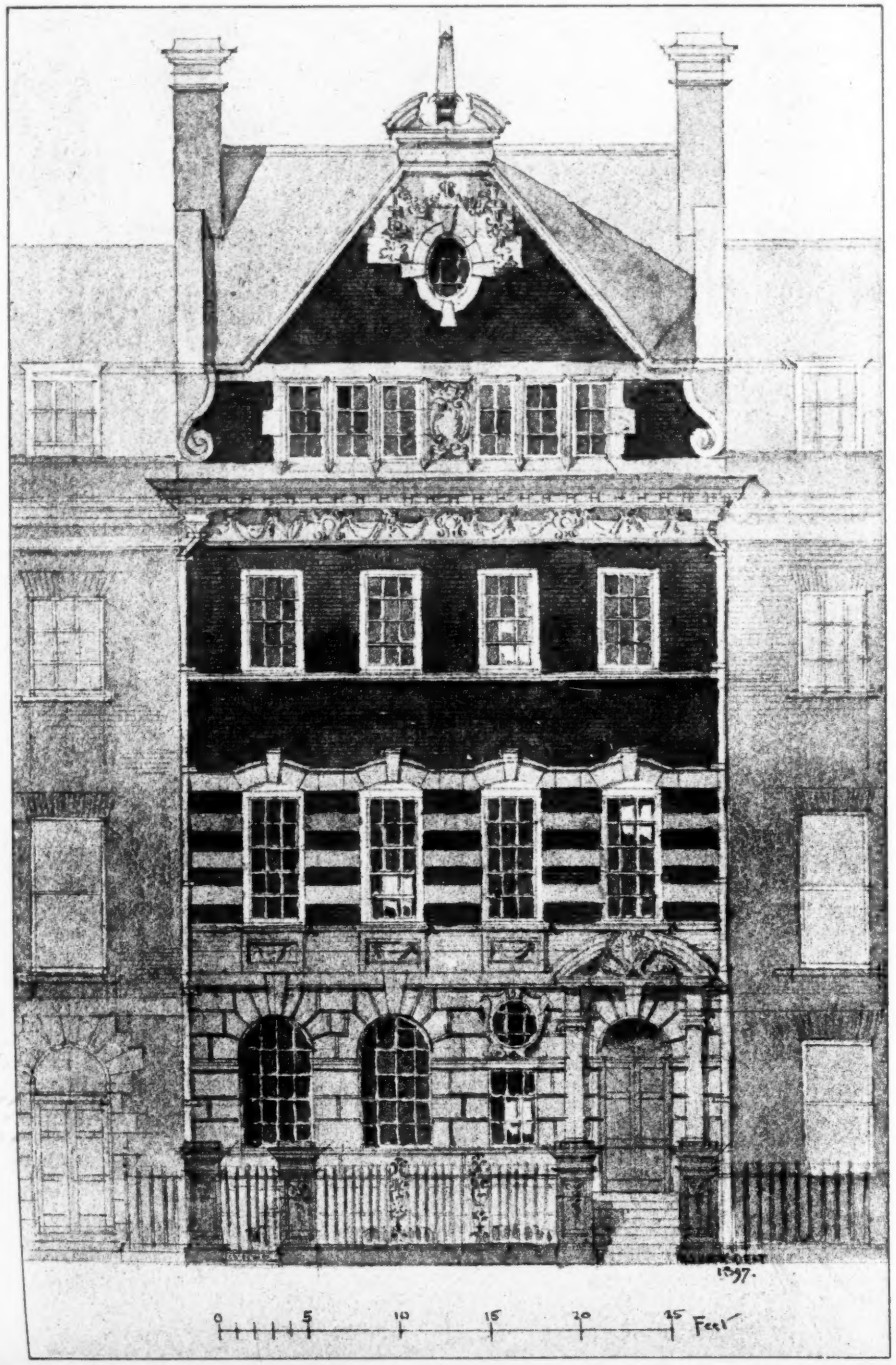
INK-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

IZE DESIG[illegible] ECOLE DES BEAUX-ARTS, PARIS

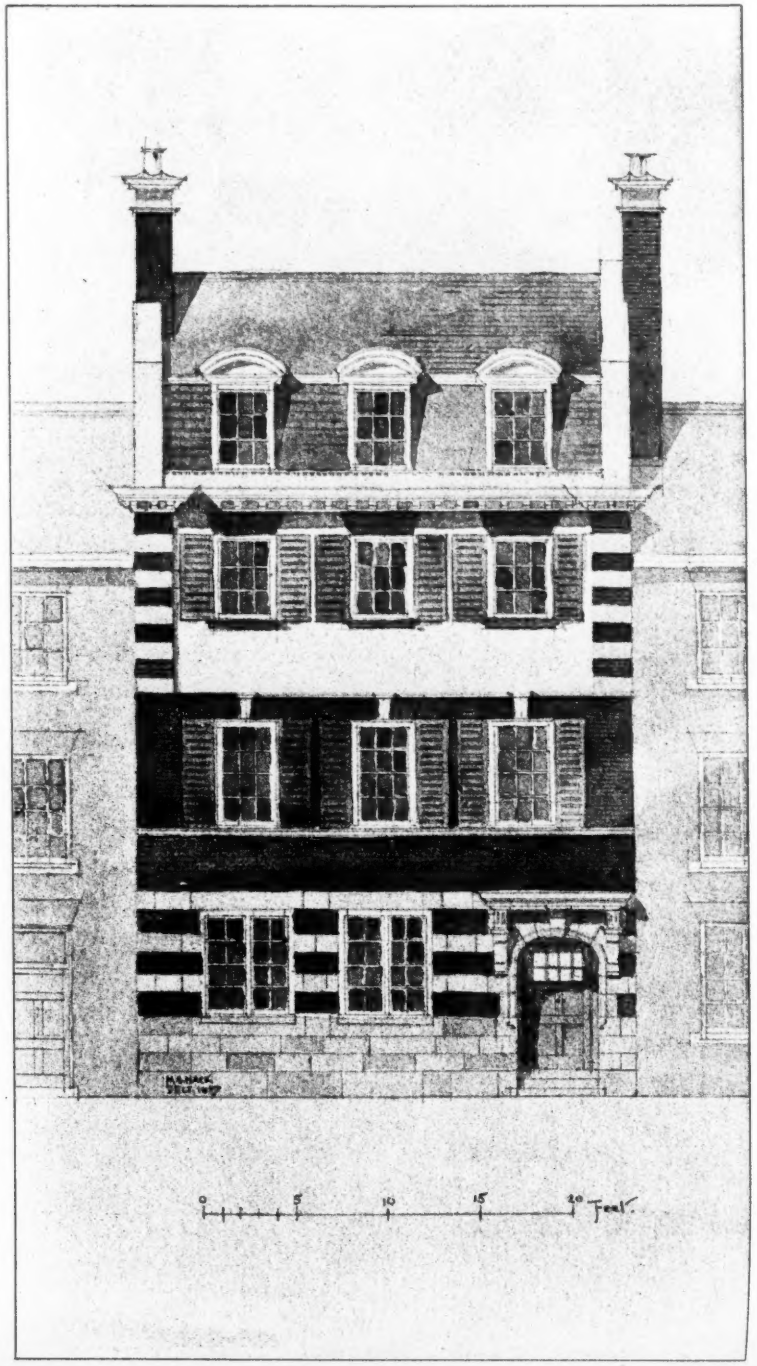


INK-PHOTO, SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

NEW ALTAR, ST. MARY'S, CHADDESDEN, DERBY.—Mr. Henry Rose, Architect

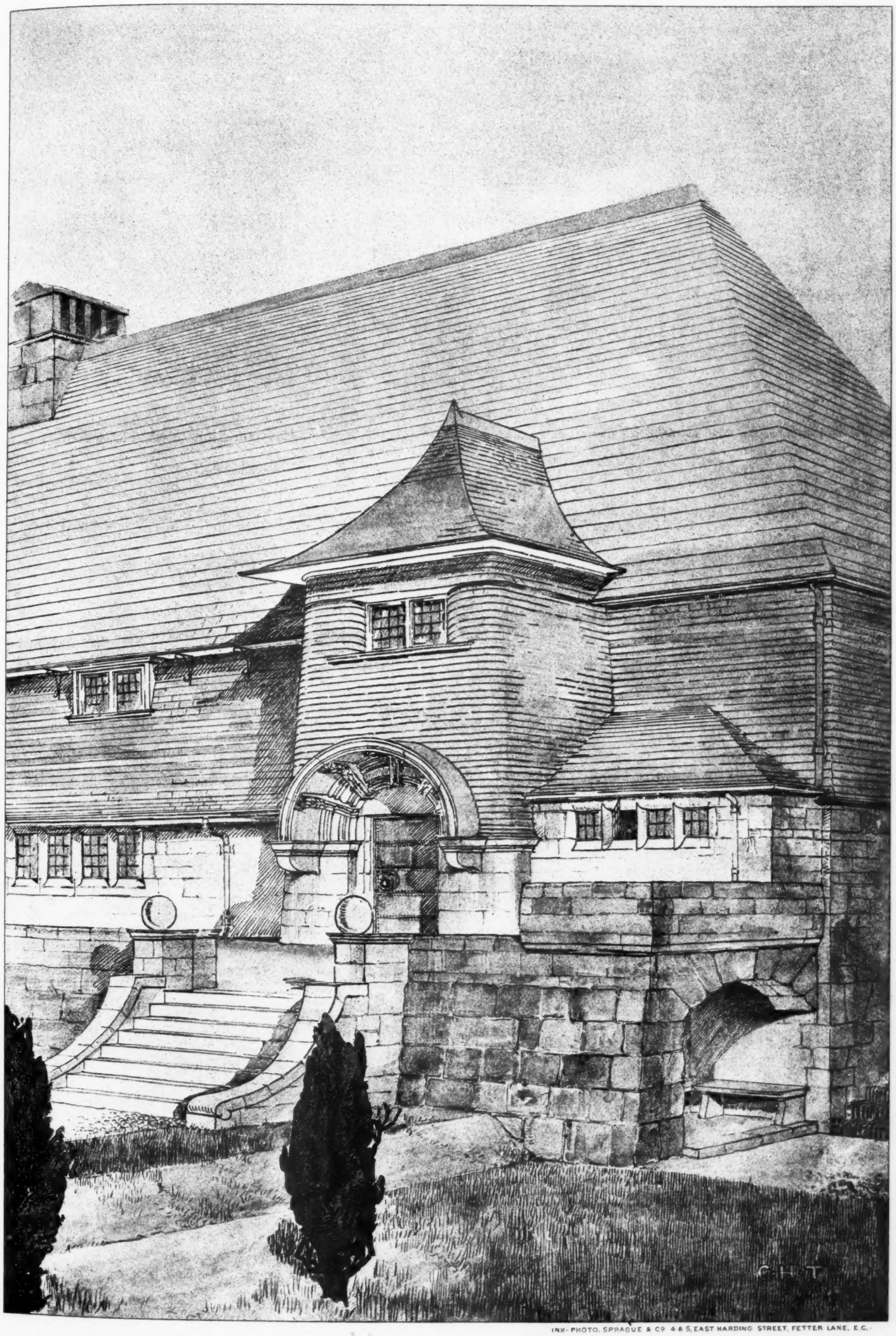


FAÇADE OF A TOWN HOUSE.—Mr. M. S. Hack, A.R.I.B.A., Architect.



81 & 82 FRIAR LANE, LEICESTER.—Mr. M. S. Hack, A.R.I.B.A., Architect.

INK-PHOTO SPRAGUE & Co. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.



INK-PHOTO. SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

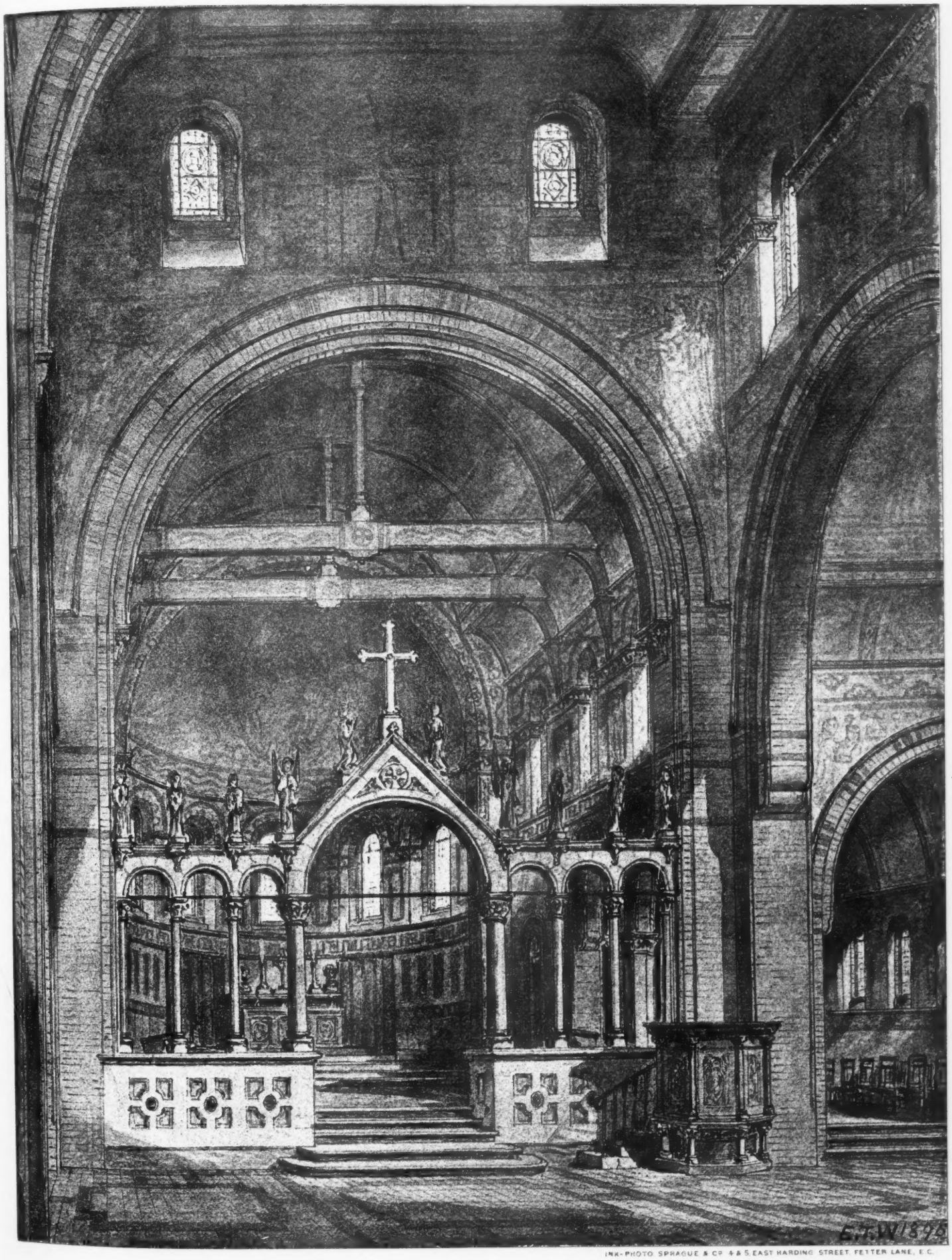
PART OF HOUSE, "CLIFF TOWERS."—Mr. C. Harrison Townsend, F.R.I.B.A., Architect.

GENERAL LIBRARY,
UNIV. OF MICH.
21

FAÇADE OF A TOWN HOUSE.—Mr. M. S. Hack, A.R.I.B.A., Architect.

INK-PHOTO. SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

81 & 82 FRIAR LANE, LEICESTER.—Mr. M. S. Hack, A.R.I.B.A., Architect.



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

NEW CHANCEL, &c., ST. BARTHOLOMEW'S CHURCH, SOUTHSEA.—Messrs. W. A. Coombs and E. Towry Whyte, Architects

GENERAL LIBRARY,
UNIV. OF MICH.
21 SEP 1933

New Chapel
Giggleswick School
Yorkshire.

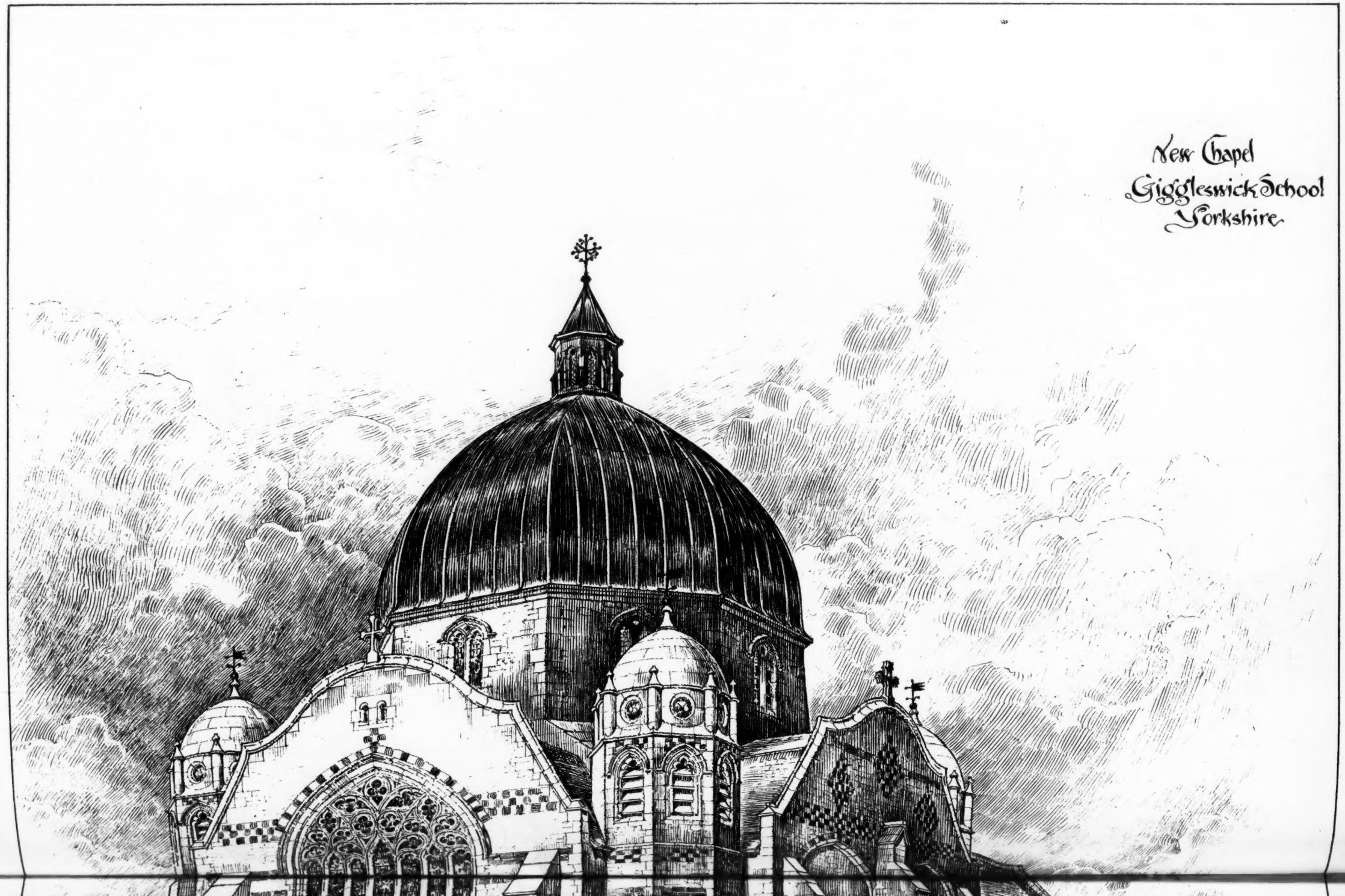


PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE NEW CHAPEL, GIGGLESWICK SCHOOL.—Mr. T. G. Jackson, R.A., Architect.

GENERAL LIBRARY,
UNIV. OF MICH.
21 SEP 1905